Food Testing

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- Apple
- Asparagus
- Aspartame in iPrep
- Bacon (Cooked)
- Beef (Ground)
- Beef Bouillon
- Beer (Light)
- Blueberry
- Broccoli
- Caramel Color
- Carrot
- Celery
- Cheese (Cracker)
- Cheese (Powder)
- Cheese (Processed)
- Cherry
- Chewing Gum
- Chicken (Boneless)
- Chili Candy (Mexican)
- Chili Powder in iPrep
- Chips (Potato)
- Citrus Leaves
- Clam Puree
- Cocoa
- Coconut
- Coffee Beans
- Cucumber
- Dog Food
- Fish Tissue
- Flounder
- Flour
- Food
- Food Coloring (Liquid)
- Fruit Juice
- Gelatin
- Granola Bar
- Grape
- Grapefruit
- Gummy Bear
- Ham
- Infant Cereal (Rice Grain)
- Infant Formula (Liquid) in iPrep
- Infant Formula (Liquid)
- Infant Formula (Powder) in iPrep
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<td>PET (Polyethylene Terephthalate)</td>
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<td>Polyterpene Resin in iPrep</td>
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<td>Polyurethane in iPrep</td>
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**Water & Wastewater Treatment**

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<tr>
<td>Waste Activated Sludge</td>
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<tr>
<td>Water (For Analysis of Phosphorous)</td>
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Agriculture
Microwave Digestion of Alfalfa

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
<th>Pressure (psi)</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of 
Boric Acid HF Neutralization

**Procedure**
Allow vessel to cool. Add 30 mL H₃BO₃ (4%) into the vessel that contains the sample and acid.

**Notes**
This procedure can be used if it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed by reaction of certain analytes with hydrofluoric acid.

Alternatively, 1-4 g of solid H₃BO₃ + 25 mL deionized H₂O can be used in place of the 4% w/v solution.

### Recommended Equipment
<table>
<thead>
<tr>
<th>MARS 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARS 6 iWave</td>
</tr>
</tbody>
</table>

### Recommended Vessels
| EasyPrep |
| EasyPrep Plus |
| MARSXpress Plus |

### Reagents
H₃BO₃ (4%)

### Max Sample Weight
Varies by Sample

### Sample Type
Organic

### Control Type
Ramp to Temperature

### Method Type
One Touch

### Heating Program
<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

### Results
See sample specific method notes.

### General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Cannabis (Plant)

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃, or alternatively 9 mL HNO₃, and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Recommended Reagents
HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
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</tbody>
</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of **Coffee Beans**

**Procedure**

Weigh 0.5 g of ground sample into the digestion vessel. Add 10 ml of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

<table>
<thead>
<tr>
<th>Recommended Equipment</th>
<th>Recommended Vessels</th>
<th>Reagents</th>
</tr>
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<tbody>
<tr>
<td>MARS 6</td>
<td>EasyPrep</td>
<td>HNO₃</td>
</tr>
<tr>
<td>MARS 6 iWave</td>
<td>EasyPrep Plus</td>
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<td></td>
<td>MARSXpress</td>
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<tr>
<td></td>
<td>MARSXpress Plus</td>
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<table>
<thead>
<tr>
<th>Max Sample Weight</th>
<th>Sample Type</th>
<th>Control Type</th>
<th>Method Type</th>
</tr>
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<tbody>
<tr>
<td>0.5 g</td>
<td>Organic</td>
<td>Ramp to Temperature</td>
<td>One Touch</td>
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</tbody>
</table>

<table>
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<tr>
<th>Heating Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage</td>
</tr>
<tr>
<td>-------</td>
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<td>1</td>
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</tbody>
</table>

*R Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 ml.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Cotton

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**

- HNO₃

**Max Sample Weight**

- 0.5 g

**Sample Type**

- Organic

**Control Type**

- Ramp to Temperature

**Method Type**

- One Touch

**Heating Program**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Feed Grain

**Procedure**
Weigh 0.5 g (0.25 g w/Xpress Vessels) of the sample into the digestion vessel. Add 10 ml of HNO₃, and 2 ml of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The addition of Conc. HCl (0-4mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARS Xpress
- MARS Xpress Plus

**Reagents**
- HNO₃
- HCl

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

<table>
<thead>
<tr>
<th>Heating Program</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Fertilizer - AOAC Method 2017.02

**Procedure**

Weigh 1 g (0.5 g for organic matrices) of the sample into the digestion vessel. Add 9 mL of HNO₃, and 3 mL HCl. Gently swirl the mixture and wait approximately 20 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4 ml) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

This method may not provide a total digest of all fertilizer samples.

**Recommended Equipment**

MARS 6  
MARS 6 iWave

**Recommended Vessels**

EasyPrep  
EasyPrep Plus  
MARSXpress  
MARSXpress Plus

**Reagents**

HNO₃  
HCl

**Max Sample Weight**

1.0 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

<table>
<thead>
<tr>
<th>Stage</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, with some particles (silicates) remaining upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Fertilizer - AOAC Method 2006.03

Procedure
Weigh 1 g (0.5 g for organic matrices) of the sample into the digestion vessel. Add 10 ml of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
This method may not provide a total digest of all fertilizer samples.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Reagents
HNO₃

Max Sample Weight
1.0 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
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</tbody>
</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Geranium

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

- Ramp times and power may vary depending on the type and number of vessels.

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**

- HNO₃

**Max Sample Weight**

- 0.5 g

**Sample Type**

- Organic

**Control Type**

- Ramp to Temperature

**Method Type**

- One Touch

**Heating Program**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
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<td>900 -1800</td>
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</tr>
</tbody>
</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Impatiens

Procedure

Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment

- MARS 6
- MARS 6 iWave

Recommended Vessels

- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

Reagents

- HNO₃

Max Sample Weight

0.5 g

Sample Type

Organic

Control Type

Ramp to Temperature

Method Type

One Touch

Heating Program

<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
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</tbody>
</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results

Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Leather

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Palm Leaves

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL HNO₃, and 2 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before sealing vessel.

**Notes**
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**
- HNO₃
- HF

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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*Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Plant Tissue

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**Notes**
The addition of Conc. HCl (0-4mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Some plant tissues contain silicates which would require HF for total dissolution.

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

**Reagents**
HNO₃

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Soybean

**Procedure**

Weigh 0.5 g of (dry weight) sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

MARS 6
MARS 6 iWave

**Recommended Vessels**

EasyPrep
EasyPrep Plus
MARSxpress
MARSXpress Plus

**Reagents**

HNO₃

**Max Sample Weight**

0.5 g (Dry Weight)

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Soybean Meal

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL HNO₃. Gently swirl the mixture and wait approximately 15 minutes before sealing vessel.

Notes

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

Reagents
- HNO₃

Max Sample Weight
- 0.5 g

Sample Type
- Organic

Control Type
- Ramp to Temperature

Method Type
- One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Spinach Leaves

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 10 ml of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Some plant tissues contain silicates which would require HF for total dissolution.

**Recommended Equipment**

<table>
<thead>
<tr>
<th>MARS 6</th>
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**Recommended Vessels**

- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**

- HNO₃

**Max Sample Weight**

| 0.5 g |

**Sample Type**

| Organic |

**Control Type**

- Ramp to Temperature

**Method Type**

- One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 ml.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Straw

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 ml of HNO₃, and 1 ml of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The above procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric HF Neutralization”

The addition of Conc. HCl (0-4mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HNO₃
HF

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 ml.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Tea Extract

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃ and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃
HCl

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of 
Tea Tannin

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL HNO₃ and 1 mL HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSXpress Plus

Reagents
HNO₃
HCl

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Tobacco

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The use of HF may be required to digest any silicates found in the sample.

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

Reagents
- HNO₃

Max Sample Weight
- 0.5 g

Sample Type
- Organic

Control Type
- Ramp to Temperature

Method Type
- One Touch

Heating Program

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Wheat

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The use of HF may be required to digest any silicates found in the sample.

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

**Reagents**
HNO₃

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Wood

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The use of HF may be required to digest any silicates found in the sample.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Wood Pulp

Procedure
Weigh 0.5 g (wet weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Reagents
HNO₃

Max Sample Weight
0.5 g (Wet Weight)

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Wool

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

Reagents
- HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
<th>Pressure (psi)</th>
<th>* Power (W)</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Yeast

Procedure
Weigh 1.0 g of dry weight (0.5 g w/Xpress vessels) into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Reagents
HNO₃

Max Sample Weight
1.0 g (Dry Weight)

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
<th>Pressure (psi)</th>
<th>* Power (W)</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Clinical & Biological
Microwave Digestion of Animal Tissue (Dry)

Procedure
Weigh 0.5 g (0.25 g w/MARSXpress Vessels) into the digestion vessel. Add 10 ml of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 ml) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Reagents
HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<tr>
<th>Stage</th>
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<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 ml.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Animal Tissue (Wet)

Procedure
Weigh 1 g (0.5 g w Xpress Vessels) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 ml) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

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<tr>
<th>Recommended Equipment</th>
<th>Recommended Vessels</th>
<th>Reagents</th>
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<tbody>
<tr>
<td>MARS 6</td>
<td>EasyPrep</td>
<td>HNO₃</td>
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<td>MARS 6 iWave</td>
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<td></td>
<td>MARSXpress</td>
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</tr>
<tr>
<td></td>
<td>MARSXpress Plus</td>
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<table>
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<th>Sample Type</th>
<th>Control Type</th>
<th>Method Type</th>
</tr>
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<tbody>
<tr>
<td>1.0 g</td>
<td>Organic</td>
<td>Ramp to Temperature</td>
<td>One Touch</td>
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<table>
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<td>Stage</td>
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</tbody>
</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Beef Bone

Procedure
Weigh 0.5 g (ground) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

<table>
<thead>
<tr>
<th>Recommended Equipment</th>
<th>Recommended Vessels</th>
<th>Reagents</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARS 6</td>
<td>EasyPrep</td>
<td>HNO₃</td>
</tr>
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<td>MARS 6 iWave</td>
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<th>Method Type</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Blood (Human)

Procedure
Transfer 2 mL of the sample into the digestion vessel. Add 5 mL of HNO₃ and 2 mL of H₂O₂. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
Take caution when mixing the acids and the sample. The sample may foam slightly.

<table>
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<tr>
<th>Max Sample Weight</th>
<th>Sample Type</th>
<th>Control Type</th>
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<tr>
<td>Stage</td>
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</tr>
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<td>1</td>
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</tbody>
</table>

*Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control/reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Blood (Human)

Procedure
Transfer 0.5 mL of the sample into the digestion vessel. Add 2 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- 10 mL MARSXpress
- 20 mL MARSXpress

Reagents
- HNO₃

Max Sample Weight
- 0.5 mL

Sample Type
- Organic

Control Type
- Ramp to Temperature

Method Type
- One Touch

Heating Program

<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
<th>Pressure (psi)</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
c) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Bovine Blood

Procedure
Transfer 1 mL of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

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<tr>
<th>Recommended Equipment</th>
<th>Recommended Vessels</th>
<th>Reagents</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARS 6</td>
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<td>MARSXpress</td>
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<table>
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<th>Max Sample Weight</th>
<th>Sample Type</th>
<th>Control Type</th>
<th>Method Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 mL</td>
<td>Organic</td>
<td>Ramp to Temperature</td>
<td>One Touch</td>
</tr>
</tbody>
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<th>Heating Program</th>
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<td>900-1800</td>
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</tbody>
</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
**Microwave Digestion of Bovine Liver (Wet)**

**Procedure**

Weigh 1.0 g (wet weight)/(0.5 g w/Xpress Vessels) into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

<table>
<thead>
<tr>
<th>Recommended Equipment</th>
<th>Recommended Vessels</th>
<th>Reagents</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARS 6</td>
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<table>
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<th>Max Sample Weight</th>
<th>Sample Type</th>
<th>Control Type</th>
<th>Method Type</th>
</tr>
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<tbody>
<tr>
<td>1.0 g (Wet Weight)</td>
<td>Organic</td>
<td>Ramp to Temperature</td>
<td>One Touch</td>
</tr>
</tbody>
</table>

<table>
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<td>Hold (mm:ss)</td>
</tr>
<tr>
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<td>15:00</td>
</tr>
</tbody>
</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control/reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Brain Tissue (Dog)

**Procedure**
Weigh 1 g (wet weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

---

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**
- HNO₃

**Max Sample Weight**
- 1.0 g (Wet Weight)

**Sample Type**
- Organic

**Control Type**
- Ramp to Temperature

**Method Type**
- One Touch

**Heating Program**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
<th>Pressure (psi)</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
**Dog Feces (Dry)**

**Procedure**

Weigh 0.2 g (dry weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

<table>
<thead>
<tr>
<th>Equipment</th>
</tr>
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<tbody>
<tr>
<td>MARS 6</td>
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<td>MARS 6 iWave</td>
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**Recommended Vessels**

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<th>Vessels</th>
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<tbody>
<tr>
<td>EasyPrep</td>
</tr>
<tr>
<td>EasyPrep Plus</td>
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<tr>
<td>MARSXpress</td>
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<tr>
<td>MARSXpress Plus</td>
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**Reagents**

<table>
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**Max Sample Weight**

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**Sample Type**

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**Control Type**

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<tr>
<td>Ramp to Temperature</td>
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**Method Type**

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**Heating Program**

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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Fingernails

**Procedure**

Weigh 0.1 g (0.05 g if using the 10 mL vessel) of the sample into the digestion vessel. Add 4 mL of HNO₃. Gently swirl the mixture before closing the vessel.

**Notes**

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- 10 mL MARSXpress
- 20 mL MARSXpress

**Reagents**

- HNO₃

**Max Sample Weight**

0.1 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
c) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Hair

**Procedure**
Weigh 0.1 g (0.05 g if using the 10 mL vessel) of the sample into the digestion vessel. Add 4 mL of HNO₃. Gently swirl the mixture before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- 10 mL MARSXpress
- 20 mL MARSXpress

**Reagents**
- HNO₃

**Max Sample Weight**
- 0.1 g

**Sample Type**
- Organic

**Control Type**
- Ramp to Temperature

**Method Type**
- One Touch

**Heating Program**

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*Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
c) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Lobster Hepatopancreas (Tort-CRM)

Procedure
Weigh 1.0 g (dry weight) (0.5 g w/Xpress Vessels) into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Reagents
HNO₃

Max Sample Weight
1.0 g (Dry Weight)

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Rat Kidney

Procedure
Weigh 1 g (wet weight) of the sample into the digestion vessel. Add 10 mL HNO₃. Gently swirl the mixture and wait approximately 15 minutes before sealing vessel.

Notes

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<th>Recommended Vessels</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Urine - Human

**Procedure**
Transfer 4 ml of the sample into the digestion vessel. Add 4 mL of HNO$_3$, and 2 mL of H$_2$O$_2$. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
Take caution when mixing the acids and the sample. The sample may foam slightly.

---

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**
- HNO$_3$
- H$_2$O$_2$

**Max Sample Weight**
4 mL

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 ml.

**General Precaution**
- a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
- b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
- c) The control / reference vessel must contain the largest and most reactive sample.
- d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
- e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Consumer Products
Microwave Digestion of Boric Acid HF Neutralization

**Procedure**
Allow vessel to cool. Add 30 mL H₃BO₃ (4%) into the vessel that contains the sample and acid.

**Notes**
This procedure can be used if it is necessary to complex the residual hydrofluoric acid or redisolve insoluble fluorides formed by reaction of certain analytes with hydrofluoric acid.

Alternatively, 1-4 g of solid H₃BO₃ + 25 mL deionized H₂O can be used in place of the 4% w/v solution.

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus
MARSXpress Plus

**Reagents**
H₃BO₃ (4%)

**Max Sample Weight**
Varies by Sample

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
See sample specific method notes.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Candle Fragrance in iPrep

Procedure
Add 0.1 g of the sample into the digestion vessel. Add 7 mL of HNO₃ and 1 mL HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
This application can only be run in the iPrep vessel.
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HNO₃
HCl

Max Sample Weight
0.1 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear and colorless upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Cosmetics (Liquid Make-Up)

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 8 mL of HNO₃ and 2 mL of HF. Gently swirl the mixture before closing the vessel.

Notes
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HNO₃
HF

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
# Microwave Digestion of Cotton

## Procedure

Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

## Notes

## Recommended Equipment

<table>
<thead>
<tr>
<th>MARS 6</th>
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</thead>
<tbody>
<tr>
<td>MARS 6 iWave</td>
</tr>
</tbody>
</table>

## Recommended Vessels

| EasyPrep |
| EasyPrep Plus |
| MARSxpress |
| MARSxpress Plus |

## Max Sample Weight

0.5 g

## Sample Type

Organic

## Reagents

HNO₃

## Control Type

Ramp to Temperature

## Method Type

One Touch

## Heating Program

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

## Results

Sample was clear, colorless, and particle free upon dilution to 50 mL.

## General Precaution

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Deodorant (Powder)

Procedure
Weigh 0.2 g of the sample into the digestion vessel. Add 2 mL of HNO₃ and 6 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

Reagents
- HNO₃
- HCl

Max Sample Weight
0.2 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Eye Shadow

Procedure
Weigh 0.25 g of the sample into the digestion vessel. Add 7 mL of HNO₃ and 3 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

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<th>Recommended Equipment</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Foam (Mattress) in iPrep

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL HNO₃ and 1 mL of H₂SO₄. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

Notes
This application can only be run in the iPrep vessel.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HNO₃
H₂SO₄

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Sanitizers (Hand)

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 1 mL of HCl and 4 mL of HNO₃ in aliquots of 1 mL. Gently swirl after each aliquot is added and allow reaction to subside before adding more HNO₃. Allow approximately 45 minutes for pre-digestion.

**Notes**

Acid addition should be added slowly and in aliquots of 1 mL, as the reaction is vigorous and exothermic upon addition of HNO₃.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**

- HCl
- HNO₃

**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Shampoo (Dandruff)

Procedure
Transfer 1 mL of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The use of HF may be required to digest any silicates found in the sample.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃

Max Sample Weight
1 mL

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
# Microwave Digestion of Soaps (Lotion and Foam)

## Procedure

Weigh 0.5 g of the sample into the digestion vessel. Add 4 mL of HNO$_3$ and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

## Notes

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

## Recommended Equipment

| MARS 6 | MARS 6 iWave |

## Recommended Vessels

| EasyPrep | EasyPrep Plus | MARSXpress | MARSXpress Plus |

## Reagents

| HNO$_3$ | HCl |

## Max Sample Weight

| 0.5 g |

## Sample Type

| Organic |

## Control Type

| Ramp to Temperature |

## Method Type

| One Touch |

## Heating Program

<table>
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*Ramp times and power may vary depending on the type and number of vessels.

## Results

Sample was clear, colorless, and particle free upon dilution to 50 mL.

## General Precaution

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Sunscreen in iPrep

Procedure
Weigh 0.25 g of the sample into the digestion vessel. Add 8 mL of HNO₃ and 2 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
This application can only be run in the iPrep vessel.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HNO₃
HF

Max Sample Weight
0.25 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 250 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
e) If using HF, follow restrictions listed in HF Addendum.
Microwave Digestion of Suppository (Capsule)

**Procedure**

Weigh 1 Capsule (approx. 1.0 g) into the digestion vessel. Add 12 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

Ensure that the capsule is completely covered with reagent before sealing the vessel.

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<th>Reagents</th>
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**Max Sample Weight**

1 Capsule (Approx 1 g)

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Toothpaste

Procedure
Weigh 0.1 g of the sample onto a filter disk and insert into the digestion vessel. Add 8 mL HNO₃ and 2 mL HF. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

Notes
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

Reagents
- HNO₃
- HF

Max Sample Weight
- 0.1 g

Sample Type
- Organic

Control Type
- Ramp to Temperature

Method Type
- One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) The control / reference vessel must contain the largest and most reactive sample.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
e) If using HF, follow restrictions listed in HF Addendum.
Microwave Digestion of Vaseline

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The use of HF may be required to digest any silicates found in the sample.

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

**Reagents**
- HNO₃

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Wax (Candle)

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

Reagents
- HNO₃

Max Sample Weight
- 0.5 g

Sample Type
- Organic

Control Type
- Ramp to Temperature

Method Type
- One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Environmental & Regulatory
Microwave Digestion of Boric Acid HF Neutralization

**Procedure**
Allow vessel to cool. Add 30 mL $\text{H}_3\text{BO}_3$ (4%) into the vessel that contains the sample and acid.

**Notes**
This procedure can be used if it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed by reaction of certain analytes with hydrofluoric acid.

Alternatively, 1-4 g of solid $\text{H}_3\text{BO}_3 + 25$ mL deionized $\text{H}_2\text{O}$ can be used in place of the 4% w/v solution.

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSxpress Plus

**Reagents**
- $\text{H}_3\text{BO}_3$ (4%)

**Max Sample Weight**
Varies by Sample

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
See sample specific method notes.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Fertilizer - AOAC Method 2017.02

**Procedure**

Weigh 1 g (0.5 g for organic matrices) of the sample into the digestion vessel. Add 9 mL of HNO₃, and 3 mL HCl. Gently swirl the mixture and wait approximately 20 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4 ml) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

This method may not provide a total digest of all fertilizer samples.

**Recommended Equipment**

MARS 6  
MARS 6 iWave

**Recommended Vessels**

EasyPrep  
EasyPrep Plus  
MARSXpress  
MARSXpress Plus

**Reagents**

HNO₃  
HCl

**Max Sample Weight**

1.0 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, with some particles (silicates) remaining upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.  

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.  

c) The control / reference vessel must contain the largest and most reactive sample.  

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.  

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Fertilizer - AOAC Method 2006.03

Procedure
Weigh 1 g (0.5 g for organic matrices) of the sample into the digestion vessel. Add 10 ml of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
This method may not provide a total digest of all fertilizer samples.

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

Reagents
HNO₃

Max Sample Weight
1.0 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
## Microwave Digestion of Fly Ash in iPrep (Step 1 of 2)

### Procedure
Add 0.1 g of the sample into the digestion vessel. Add 3 mL of H$_2$SO$_4$ and 3 mL of H$_3$PO$_4$. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

### Notes
This application can only be run in the iPrep vessel.

### Recommended Equipment
- MARS 6 iWave

### Recommended Vessels
- iPrep

### Reagents
- H$_2$SO$_4$
- H$_3$PO$_4$

### Max Sample Weight
- 0.1 g

### Sample Type
- Organic

### Control Type
- Ramp to Temperature

### Method Type
- One Touch

### Heating Program

<table>
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* Ramp times and power may vary depending on the type and number of vessels.
Microwave Digestion of Fly Ash in iPrep (Step 2 of 2)

**Procedure**
Allow vessels to cool. Open and add 1.5 mL of HNO₃, 1.5 mL of HCl, and 1.5 mL of HF. Wait approximately 15 minutes before closing the vessel.

Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides.

**Notes**
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

The addition of Conc. HCl (0-4 ml) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes.

**Reagents**
- HNO₃
- HCl
- HF

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

d) If programming as one touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Limestone

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 7.5 mL of HNO₃ and 2.5 ml of HF. Gently swirl the mixture before closing the vessel.

**Notes**
Allow any initial reaction to subside before sealing the vessel.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve in soluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus

**Reagents**
HNO₃
HF

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless and particle free upon dilution to 50 ml.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of NPDES (Waste Water)

**Procedure**
Transfer 50 mL of the sample into the digestion vessel. Add 3 mL of HNO₃, and 2 mL HCl. Gently swirl the mixture before closing the vessel.

**Notes**
The addition of Conc. HCl (0-4mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
75 mL MARSXpress
EasyPrep
EasyPrep Plus
MARSXpress Plus

**Reagents**
HNO₃
HCl

**Max Sample Weight**
50 mL

**Sample Type**
Water

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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*Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Pine Needles

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 8 mL of HNO₃ and 2 mL of H₂O₂ (30%). Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

<table>
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<tr>
<td>MARS 6 iWave</td>
</tr>
</tbody>
</table>

**Recommended Vessels**

| EasyPrep |
| EasyPrep Plus |
| MARSXpress |
| MARSXpress Plus |

**Reagents**

| HNO₃ |
| H₂O₂ (30%) |

**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

<table>
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*Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of RoHS (For Pb, Hg, and Cd Analysis)

**Procedure**
Weigh 0.2 g of the sample into the digestion vessel. Add 10 mL of HNO₃ and 0.02 mL of H₂SO₄. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**
- HNO₃
- H₂SO₄

**Max Sample Weight**
- 0.2 g

**Sample Type**
- Organic

**Control Type**
- Ramp to Temperature

**Method Type**
- One Touch

**Heating Program**

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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Sediment (BCCS - 1 CRM) (Leach)

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
This method may not provide a total digest of all samples. Hydrofluoric acid will be required to provide complete digestion of some sample matrices.

The addition of Conc. HCl (0-4 ml) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
<thead>
<tr>
<th>Stage</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Sediment (Buffalo River) (Leach)

### Procedure

Weigh 0.5 g into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

### Notes

This method may not provide a total digest of all samples. Hydrofluoric acid will be required to provide complete digestion of some sample matrixes.

The addition of Conc. HCl (0-4 ml) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

### Recommended Equipment

<table>
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<th>Control Type</th>
<th>Method Type</th>
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<td>Organic</td>
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### Recommended Vessels

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### Reagents

| HNO₃ |

### Recommended Equipment

<table>
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### Heating Program

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*Ramp times and power may vary depending on the type and number of vessels.

### Results

Sample was clear, colorless, and particle free upon dilution to 50 mL.

### General Precaution

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Sludge (Industrial)

Procedure
Weigh 0.5 g (dry weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The use of HF may be required to digest any silicates found in the sample.

The addition of Conc. HCl (0-4 ml) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Reagents
HNO₃

Max Sample Weight
0.5 g (Dry Weight)

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Soil (Montana - CRM) (Leach)

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
This method may not provide a total digest of all samples. Hydrofluoric acid will be required to provide complete digestion of some sample matrixes.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of TCLP Extract

Procedure
Transfer 25 mL of the sample into the digestion vessel. Add 5 mL of HNO₃. Gently swirl the mixture before closing the vessel.

If a high organic content is suspected, a 10 ml sample volume is recommended.

Notes

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

Reagents
- HNO₃

Max Sample Weight
- 25 mL

Sample Type
- Water

Control Type
- Standard Control

Method Type
- One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
US EPA 3015 (Aqueous Samples)

Procedure
Transfer 45 mL of the sample into the digestion vessel. Add 5 mL of HNO₃. Gently swirl the mixture before closing the vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
75 mL MARSxpress
EasyPrep Plus
MARSxpress Plus

Reagents
HNO₃

Max Sample Weight
45 mL

Sample Type
Water

Control Type
Standard Control

Method Type
One Touch

Heating Program

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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
This method is intended to be an acid leach, not a total digest. Hydrofluoric acid will be required to provide complete digestion of the sample matrix.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
US EPA 3015a (Aqueous Sample)

Procedure
Transfer 45 mL of the sample into the digestion vessel. Add 5 mL of HNO₃, or alternatively 4 mL of HNO₃ and 1 mL HCl. Gently swirl the mixture before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- 75 mL MARSxpress
- EasyPrep Plus
- MARSxpress Plus

Reagents
- HNO₃
- HCl (Optional)

Max Sample Weight
45 mL

Sample Type
Water

Control Type
Standard Control

Method Type
One Touch

Heating Program
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* Ramp times and power may vary depending on the type and number of vessels.

Results
This method is intended to be an acid leach, not a total digest. Hydrofluoric acid will be required to provide complete digestion of the sample matrix.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
US EPA 3051 (Solid Sample)

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture before closing the vessel.

---

**Notes**

---

**Recommended Equipment**

MARS 6
MARS 6 iWave

**Recommended Vessels**

EasyPrep Plus
MARSxpress
MARSxpress Plus

**Reagents**

HNO₃
HCl (Optional)

**Max Sample Weight**

0.5 g

**Sample Type**

Solid

**Control Type**

Standard Control

**Method Type**

One Touch

**Heating Program**

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

This method is intended to be an acid leach, not a total digest.

---

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
US EPA 3051a (Solid Sample)

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃, or alternatively 9 mL HNO₃, and 1 mL HCl. Gently swirl the mixture before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃
HCl (Optional)

Max Sample Weight
0.5 g

Sample Type
Solid

Control Type
Standard Control

Method Type
One Touch

Heating Program

<table>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
This method is intended to be an acid leach, not a total digest.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
US EPA 3052 (Sludge, Soil, Sediment or Oil)

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃, and 3 mL HF. Gently swirl the mixture before closing the vessel.

Notes
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used. This procedure can be found in the method note entitled “Boric Acid HF Neutralization”.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃
HF

Max Sample Weight
0.5 g

Sample Type
Solid

Control Type
Standard Control

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of USP 232/233 (Pharmaceuticals)

Procedure
Weigh 0.2 g of the sample into the digestion vessel. Add 9 mL of HNO₃, and 1 mL HCl. Gently swirl the mixture before closing the vessel.

Notes
The addition of Conc. HCl (0-4mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Recommended Reagents
HNO₃
HCl

Max Sample Weight
0.2 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of 
Waste Activated Sludge

Procedure
Weigh 0.5 g (dry weight) (0.25 g w/Xpress Vessels) of the sample into the digestion vessel. Add 5 mL of HNO₃, and 5 mL of H₂O₂. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Reagents
HNO₃
H₂O₂

Max Sample Weight
0.5 g (Dry Weight)

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Water (For Analysis of Phosphorous)

**Procedure**
Transfer 50 mL of H₂O into the digestion vessel. Add 0.5 g of K₂S₂O₈ and 1 mL of H₂SO₄. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
MARS 6

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

**Reagents**
- K₂S₂O₈
- H₂SO₄

**Max Sample Weight**
50 mL

**Sample Type**
Water

**Control Type**
Ramp to Temperature

**Method Type**
Classic

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Wood

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The use of HF may be required to digest any silicates found in the sample.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Food Testing
Microwave Digestion of Alum

Procedure
Weigh 0.1 g of the sample into the digestion vessel. Add 3 mL of HCl, 5 mL of HF, and 2 mL HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides.

Notes
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HNO₃
HCl
HF

Max Sample Weight
0.1 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Apple

Procedure
Weigh 0.5 g (dry weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

Reagents
- HNO₃

Max Sample Weight
0.5 g (Dry Weight)

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Asparagus

**Procedure**
Weigh 0.5 g (dry weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

**Reagents**
HNO₃

---

**Max Sample Weight**
0.5 (Dry Weight)

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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*Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Aspartame in iPrep

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
This application can only be run in the iPrep vessel.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Bacon (Cooked)

Procedure
Weigh 1.0 g of the sample into the digestion vessel. Add 8 mL of HNO₃ and 2 mL of DI H₂O. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Reagents
HNO₃
DI H₂O

Max Sample Weight
1.0 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
**Microwave Digestion of Beef (Ground)**

**Procedure**

Weigh 1.0 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

**Reagents**
- HNO₃

**Max Sample Weight**
- 1.0 g

**Sample Type**
- Organic

**Control Type**
- Ramp to Temperature

**Method Type**
- One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of 
Beef Bouillon

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

Reagents
- HNO₃

Max Sample Weight
- 0.5 g

Sample Type
- Organic

Control Type
- Ramp to Temperature

Method Type
- One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Beer (Light)

Procedure
Transfer 4 mL of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Reagents
HNO₃

Max Sample Weight
4 mL

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Blueberry

**Procedure**
Weigh 0.5 g (dry weight) of the sample into the digestion vessel. Add 10 mL of HNO$_3$. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

**Reagents**
- HNO$_3$

**Max Sample Weight**
- 0.5 g (Dry Weight)

**Sample Type**
- Organic

**Control Type**
- Ramp to Temperature

**Method Type**
- One Touch

**Heating Program**

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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
- a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
- b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
- c) The control / reference vessel must contain the largest and most reactive sample.
- d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
- e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
**Microwave Digestion of Broccoli**

**Procedure**
Weigh 0.5 g (dry weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**
- HNO₃

**Max Sample Weight**
0.5 g (Dry Weight)

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

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*Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Caramel Color

Procedure
Transfer 2.0 mL of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Reagents
HNO₃

Max Sample Weight
2.0 mL

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Carrot

Procedure
Weigh 0.5 g (dry weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃

Max Sample Weight
0.5 g (Dry Weight)

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Celery

**Procedure**

Weigh 0.5 g (dry weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

| MARS 6 |
| MARS 6 iWave |

**Recommended Vessels**

| EasyPrep |
| EasyPrep Plus |
| MARSxpress |
| MARSxpress Plus |

**Reagents**

HNO₃

**Max Sample Weight**

0.5 g (Dry Weight)

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Cheese (Cracker)

Procedure
Weigh 0.5 g of ground sample into the digestion vessel. Add 10 mL of HNO$_3$. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl may vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO$_3$

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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*Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Cheese (Powder)

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO3. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Reagents
HNO3

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Cheese (Processed)

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 10 ml of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

**Reagents**

- HNO₃

**Max Sample Weight**

- 0.5 g

**Sample Type**

- Organic

**Control Type**

- Ramp to Temperature

**Method Type**

- One Touch

**Heating Program**

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Cherry

**Procedure**
Weigh 0.5 g (dry weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

**Reagents**
HNO₃

**Max Sample Weight**
0.5 g (Dry Weight)

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of 
Chewing Gum

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

The use of HF may be required to digest any silicates found in the sample.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 ml.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Chicken (Boneless)

**Procedure**

Weigh 0.5 g (dry weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

MARS 6
MARS 6 iWave

**Recommended Vessels**

EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

**Reagents**

HNO₃

**Max Sample Weight**

0.5 g (Dry Weight)

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Chili Candy (Mexican)

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

**Reagents**
- HNO₃

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
- a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
- b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
- c) The control / reference vessel must contain the largest and most reactive sample.
- d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
- e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Chili Powder in iPrep

**Procedure**
Weigh 2 g of the sample into the digestion vessel. Add 10 mL HNO₃ and 5 mL deionized H₂O. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
This application can only be run in the iPrep vessel.

The use of HF may be required to digest any silicates found in the sample.

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<th>Recommended Equipment</th>
<th>Recommended Vessels</th>
<th>Reagents</th>
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<td>HNO₃</td>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear and colorless with some small particles (silicates) remaining upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Chips (Potato)

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**
- HNO₃

**Max Sample Weight**
- 0.5 g

**Sample Type**
- Organic

**Control Type**
- Ramp to Temperature

**Method Type**
- One Touch

**Heating Program**

<table>
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*Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Citrus Leaves

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 6 mL of HNO₃, 3 mL of deionized H₂O, and 1 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides.

**Notes**
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus

**Reagents**
- HNO₃
- DI H₂O
- HF

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

### Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
**Microwave Digestion of Clam Puree**

**Procedure**

Weigh 1 g (wet weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**

- HNO₃

**Max Sample Weight**

- 1.0 g (Wet Weight)

**Sample Type**

- Organic

**Control Type**

- Ramp to Temperature

**Method Type**

- One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
**Microwave Digestion of Cocoa**

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**
- HNO₃

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Coconut

**Procedure**

Weigh 1 g (wet weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

<table>
<thead>
<tr>
<th>MARS 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARS 6 iWave</td>
</tr>
</tbody>
</table>

**Recommended Vessels**

| EasyPrep |
| EasyPrep Plus |
| MARSXpress |
| MARSXpress Plus |

**Reagents**

HNO₃

**Max Sample Weight**

1.0 g (Wet Weight)

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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*Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Coffee Beans

**Procedure**

Weigh 0.5 g of ground sample into the digestion vessel. Add 10 ml of HNO$_3$. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

**Reagents**

- HNO$_3$

<table>
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<tr>
<th>Max Sample Weight</th>
<th>Sample Type</th>
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<th>Method Type</th>
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**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 ml.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
**Microwave Digestion of Cucumber**

**Procedure**
Weigh 0.5 g (dry weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Relevant Equipment**

<table>
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<th>Recommended Vessels</th>
<th>Reagents</th>
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**Max Sample Weight**
0.5 g (Dry Weight)

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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*Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Dog Food

Procedure

Weigh 0.5 g of (dry weight) up to 1 g (wet weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment

MARS 6
MARS 6 iWave

Recommended Vessels

EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Reagents

HNO₃

Max Sample Weight

0.5 g (Dry Weight)

Sample Type

Organic

Control Type

Ramp to Temperature

Method Type

One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results

Sample was clear, colorless, and particle free upon dilution to 50 Ml

General Precaution

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of 
Fish Tissue

**Procedures**
Weight 0.5 g (dry weight) up to 2 g (wet weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**
- HNO₃

**Max Sample Weight**
- 0.5 g (Dry Weight)

**Sample Type**
- Organic

**Control Type**
- Ramp to Temperature

**Method Type**
- One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Flounder

**Procedure**
Weigh 2 g (wet weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**
- HNO₃

**Max Sample Weight**
- 2.0 g (Wet Weight)

**Sample Type**
- Organic

**Control Type**
- Ramp to Temperature

**Method Type**
- One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Flour

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Food

Procedure
Weigh 0.5 g dry weight (0.25 g w/Xpress vessels) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃

Max Sample Weight
0.5 g (Dry Weight)

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Food Coloring (Liquid)

**Procedure**
Transfer 0.5 mL of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

**Reagents**
HNO₃

**Max Sample Weight**
0.5 mL.

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Fruit Juice

Procedure
Transfer 2.5 mL of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

Reagents
- HNO₃

Max Sample Weight
- 2.5 mL

Sample Type
- Organic

Control Type
- Ramp to Temperature

Method Type
- One Touch

Heating Program

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Gelatin

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO\(_3\). Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**

- HNO\(_3\)

**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Granola Bar

Procedure
Weigh 0.5 g of ground sample into the digestion vessel. Add 10 mL of \text{HNO}_3. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
\text{HNO}_3

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Grape

Procedure
Weigh 0.5 g (dry weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

<table>
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<tr>
<th>Recommended Equipment</th>
<th>Recommended Vessels</th>
<th>Reagents</th>
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<td>HNO₃</td>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Grapefruit

**Procedure**
Weigh 0.5 g (dry weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**
- HNO₃

**Max Sample Weight**
- 0.5 g (Dry Weight)

**Sample Type**
- Organic

**Control Type**
- Ramp to Temperature

**Method Type**
- One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Gummy Bear

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

**Reagents**
- HNO₃

**Max Sample Weight**
- 0.5 g

**Sample Type**
- Organic

**Control Type**
- Ramp to Temperature

**Method Type**
- One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Ham

Procedure
Weigh 1.0 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

Reagents
- HNO₃

Max Sample Weight
- 1.0 g

Sample Type
- Organic

Control Type
- Ramp to Temperature

Method Type
- One Touch

Heating Program

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Infant Cereal (Rice Grain)

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

Reagents
- HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Infant Formula (Liquid) in iPrep

Procedure
Transfer 2 mL of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

Notes
This application can only be run in the iPrep vessel.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HNO₃

Max Sample Weight
2 mL

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Infant Formula (Liquid)

Procedure
Transfer 1 mL (0.5 mL w/Xpress Vessels) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃

Max Sample Weight
1 mL

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Infant Formula (Powder) in iPrep

Procedure
Weigh 1 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

Notes
This application can only be run in the iPrep vessel.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HNO₃

Max Sample Weight
1.0 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program
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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Infant Formula (Powder)

**Procedure**

Weigh 0.5 g (0.25 g w/Xpress Vessels) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

MARS 6
MARS 6 iWave

**Recommended Vessels**

EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

**Reagents**

HNO₃

**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Kidney Bean

**Procedure**
Weigh 0.5 g (dry weight) into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

**Reagents**
- HNO₃

**Max Sample Weight**
0.5 (Dry Weight)

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Kielbasa Sausage

Procedure

Weigh 1 g (wet weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃

Max Sample Weight
1.0 g (Wet Weight)

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results

Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Maple Syrup

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Reagents
HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Mayonnaise

**Procedure**
Weigh 0.25 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus
MARSxpress
MARSXpress Plus

**Reagents**
HNO₃

**Max Sample Weight**
0.25 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Meal Replacement Shake (Chocolate)

Procedure
Weigh 0.5 g (dry mix) of the sample into the digestion vessel. Add 10 mL HNO₃. Gently swirl the mixture and wait approximately 15 minutes before sealing vessel.

Notes

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

Reagents
- HNO₃

Max Sample Weight
- 0.5 g (Dry Mix)

Sample Type
- Organic

Control Type
- Ramp to Temperature

Method Type
- One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Milk (Whole - Liquid)

Procedure
Transfer 4 mL of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

Reagents
- HNO₃

Max Sample Weight
4 mL

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Milk (Powder)

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus
MARSxpress
MARSXpress Plus

**Reagents**
HNO₃

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

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*Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Nutritional Drink (Adult)

### Procedure
Transfer 1.0 mL of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

### Notes

### Recommended Equipment
- MARS 6
- MARS 6 iWave

### Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

### Reagents
- HNO₃

### Max Sample Weight
1.0 mL

### Sample Type
Organic

### Control Type
Ramp to Temperature

### Method Type
One Touch

### Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

### Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

### General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
**Microwave Digestion of Olive Oil**

### Procedure

Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

### Notes

**Recommended Equipment**

| MARS 6 | MARS 6 iWave |

**Recommended Vessels**

| EasyPrep | EasyPrep Plus |

**Reagents**

| HNO₃ |

### Max Sample Weight

| 0.5 g |

**Sample Type**

| Organic |

**Control Type**

| Ramp to Temperature |

**Method Type**

| One Touch |

### Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Orange Juice

**Procedure**
Transfer 2.5 ml of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

**Reagents**
HNO₃

**Max Sample Weight**
2.5 mL

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of 
Oyster Puree

Procedure
Weigh 1 g (wet weight) of the sample into the digestion vessel. Add 10 mL HNO₃. Gently swirl the mixture and wait approximately 15 minutes before sealing vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃

Max Sample Weight
1.0 g (Wet Weight)

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Peanut Butter

**Procedure**

Weigh 0.25 g of the sample into the digestion vessel. Add 10 mL of HNO$_3$. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**

- HNO$_3$

**Max Sample Weight**

0.25 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Pear

**Procedure**

Weigh 0.5 g (dry weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

MARS 6
MARS 6 iWave

**Recommended Vessels**

EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

**Reagents**

HNO₃

**Max Sample Weight**

0.5 g (Dry Weight)

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Pepper (Bell, Chili, Etc.)

**Procedure**

Weigh 0.5 g (dry weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

MARS 6
MARS 6 iWave

**Recommended Vessels**

EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

**Reagents**

HNO₃

**Max Sample Weight**

0.5 g (Dry Weight)

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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*Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Pistachio Nuts

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL HNO₃. Gently swirl the mixture and wait approximately 15 minutes before sealing vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

**Reagents**
- HNO₃

**Max Sample Weight**
- 0.5 g

**Sample Type**
- Organic

**Control Type**
- Ramp to Temperature

**Method Type**
- One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Pizza (Frozen, Pepperoni)

Procedure
Weigh 1.0 g (homogenized) into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃

Max Sample Weight
1.0 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
The sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Plum

Procedure
Weigh 0.5 g (dry weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃

Max Sample Weight
0.5 g (Dry Weight)

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Pork (Ground)

**Procedure**

Weigh 2.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

| MARS 6 |
| MARS 6 iWave |

**Recommended Vessels**

| EasyPrep |
| EasyPrep Plus |
| MARSxpress |
| MARSxpress Plus |

**Reagents**

| HNO₃ |

**Max Sample Weight**

| 2.5 g |

**Sample Type**

| Organic |

**Control Type**

| Ramp to Temperature |

**Method Type**

| One Touch |

**Heating Program**

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*Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Potato

**Procedure**

Weigh 0.5 g (dry weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

| MARS 6 |
| MARS 6 iWave |

**Recommended Vessels**

| EasyPrep |
| EasyPrep Plus |
| MARSxpress |
| MARSxpress Plus |

**Reagents**

HNO₃

**Max Sample Weight**

0.5 g (Dry Weight)

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Potato Chips

Procedure
Weigh 0.5 g (ground) of the sample into the digestion vessel. Add 10 mL HNO₃. Gently swirl the mixture and wait approximately 15 minutes before sealing vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃

Max Sample Weight
0.5 g (Ground)

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Pretzel (Salted)

Procedure
Weigh 0.5 g (dry weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

Reagents
- HNO₃

Max Sample Weight
- 0.5 g (Dry Weight)

Sample Type
- Organic

Control Type
- Ramp to Temperature

Method Type
- One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Protein Bar

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

MARS 6
MARS 6 iWave

**Recommended Vessels**

EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

**Reagents**

HNO₃

**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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*Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Raspberry

**Procedure**

Weigh 0.5 g (dry weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

MARS 6
MARS 6 iWave

**Recommended Vessels**

EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

**Recommended Reagents**

HNO₃

**Max Sample Weight**

0.5 g (Dry Weight)

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Rice

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

| MARS 6 |
| MARS 6 iWave |

**Recommended Vessels**

| EasyPrep |
| EasyPrep Plus |
| MARSxpress |
| MARSxpress Plus |

**Reagents**

| HNO₃ |

**Max Sample Weight**

| 0.5 g |

**Sample Type**

| Organic |

**Control Type**

| Ramp to Temperature |

**Method Type**

| One Touch |

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Safflower Oil

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

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**Recommended Equipment**

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**Recommended Vessels**

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**Reagents**

HNO₃

**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Salad Dressing (Ranch)

**Procedure**
Weigh 0.5 g (dry mix) of the sample into the digestion vessel. Add 10 mL HNO₃. Gently swirl the mixture and wait approximately 15 minutes before sealing vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**
- HNO₃

**Max Sample Weight**
- 0.5 g (Dry Mix)

**Sample Type**
- Organic

**Control Type**
- Ramp to Temperature

**Method Type**
- One Touch

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<th>Heating Program</th>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Salami

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

Reagents
- HNO₃

Max Sample Weight
- 0.5 g

Sample Type
- Organic

Control Type
- Ramp to Temperature

Method Type
- One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Sausage

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

MARS 6
MARS 6 iWave

**Recommended Vessels**

EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

**Reagents**

HNO₃

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<th>Max Sample Weight</th>
<th>Sample Type</th>
<th>Control Type</th>
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<td>0.5 g</td>
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**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Soda (Diet)

Procedure
Transfer 1 mL of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

<table>
<thead>
<tr>
<th>Recommended Equipment</th>
<th>Recommended Vessels</th>
<th>Reagents</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARS 6</td>
<td>EasyPrep</td>
<td>HNO₃</td>
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<th>Method Type</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Sodium Free - Seasoning

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL HNO₃. Gently swirl the mixture and wait approximately 15 minutes before sealing vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Recommended Reagents
HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Soybean

Procedure
Weigh 0.5 g of (dry weight) sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Recommended Equipment
MARS 6
MARS 6 iWave

Max Sample Weight
0.5 g (Dry Weight)

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Spinach

**Procedure**

Weigh 0.5 g (dry weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

MARS 6
MARS 6 iWave

**Recommended Vessels**

EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

**Reagents**

HNO₃

**Max Sample Weight**

0.5 g (Dry Weight)

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Spinach Leaves

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Some plant tissues contain silicates which would require HF for total dissolution.

**Recommended Equipment**

MARS 6
MARS 6 iWave

**Recommended Vessels**

EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

**Reagents**

HNO₃

**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Spinach Pasta

Procedure
Weigh 0.5 g (dry weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

Reagents
- HNO₃

Max Sample Weight: 0.5 g (Dry Weight)
Sample Type: Organic
Control Type: Ramp to Temperature
Method Type: One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Strawberry

**Procedure**
Weigh 0.5 g (dry weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**
- HNO₃

**Max Sample Weight**
- 0.5 g (Dry Weight)

**Sample Type**
- Organic

**Control Type**
- Ramp to Temperature

**Method Type**
- One Touch

**Heating Program**

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*Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Sugar (Granulated)

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

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<th>Recommended Equipment</th>
<th>Recommended Vessels</th>
<th>Reagents</th>
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Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Tea (Chai) in iPrep

**Procedure**

Weigh 2.5 g of the sample into the digestion vessel. Add 10 mL HNO₃ and 5 mL deionized H₂O. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

This application can only be run in the iPrep vessel.

The use of HF may be required to digest any silicates found in the sample.

<table>
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<th>Recommended Equipment</th>
<th>Recommended Vessels</th>
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<td>iPrep</td>
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<th>Control Type</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear and colorless with some small particles (silicates) remaining upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Tea Leaves

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

**Reagents**

- HNO₃

**Max Sample Weight**

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Control Type</th>
<th>Method Type</th>
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**Heating Program**

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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Tomato Leaves

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
Some plant tissues contain silicates which would require HF for total dissolution.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, with white silica particles upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Tomato Paste (70% Moisture)

Procedure
Weigh 2 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

Reagents
- HNO₃

Max Sample Weight
- 2.0 g

Sample Type
- Organic

Control Type
- Ramp to Temperature

Method Type
- One Touch

Heating Program

<table>
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</tbody>
</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Tomato Soup

Procedure
Transfer 5 mL of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

Reagents
- HNO₃

Max Sample Weight
- 5 mL

Sample Type
- Organic

Control Type
- Ramp to Temperature

Method Type
- One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Walnut

**Procedure**

Weigh 0.5 g (dry weight) into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

<table>
<thead>
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<th>MARS 6</th>
</tr>
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<tbody>
<tr>
<td>MARS 6 iWave</td>
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</table>

**Recommended Vessels**

| EasyPrep |
| EasyPrep Plus |
| MARSxpress |
| MARSxpress Plus |

**Reagents**

HNO₃

**Max Sample Weight**

0.5 g (Dry Weight)

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

<table>
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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Watermelon

**Procedure**

Weigh 0.5 g (dry weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

| MARS 6 |
| MARS 6 iWave |

**Recommended Vessels**

| EasyPrep |
| EasyPrep Plus |
| MARSxpress |
| MARSxpress Plus |

**Reagents**

HNO₃

**Max Sample Weight**

0.5 g (Dry Weight)

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

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*Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Wheat Crackers

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus
MARSxpress
MARSXpress Plus

**Reagents**
HNO₃

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Whey

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

**Reagents**

- HNO₃

**Max Sample Weight**

- 0.5 g

**Sample Type**

- Organic

**Control Type**

- Ramp to Temperature

**Method Type**

- One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Whey (Powder)

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSXpress Plus

Reagents
HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Wine

**Procedure**
Transfer 1 mL of the sample into the digestion vessel. Add 10 mL of HNO$_3$. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

**Reagents**
- HNO$_3$

**Max Sample Weight**
- 1 mL

**Sample Type**
- Organic

**Control Type**
- Ramp to Temperature

**Method Type**
- One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Yogurt (Plain)

**Procedure**
Weigh 1.0 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**
- HNO₃

**Max Sample Weight**
1.0 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of 
Alpha - Alumina in iPrep

Procedure
Weigh 0.5 g of sample into the digestion vessel. Add 10 mL HCl. Gently swirl the vessel to thoroughly mix the sample and acid.

Notes
This application can only be run in the iPrep vessel.
The maximum number of vessels that can be run for this method is 6.
Ensure that particles are well suspended in acid mixture prior to sealing vessel.
Stirring may be helpful to keep particles suspended in solution during digestion.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HCl

Max Sample Weight
0.5 g

Sample Type
HCl

Control Type
Ramp to Temperature

Method Type
Classic

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Alumina Beads (with Silver Substrate) in iPrep (Step 1 of 2)

**Procedure**

Weigh 0.25 g of the sample into the digestion vessel. Add 6.5 mL of H$_3$PO$_4$, and 3.5 mL of H$_2$SO$_4$. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

This application can only be run in the iPrep vessel.

**Recommended Equipment**

MARS 6 iWave

**Recommended Vessels**

iPrep

**Reagents**

H$_3$PO$_4$

H$_2$SO$_4$

**Max Sample Weight**

0.25 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

<table>
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* Ramp times and power may vary depending on the type and number of vessels.
Microwave Digestion of
Alumina Beads (with Silver Substrate) (Step 2 of 2)

**Procedure**
Allow vessel to cool after completion of Step 1. Proceeding step one, add 3 mL of HNO₃, and 3 mL HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

**Reagents**
- HNO₃
- HF

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
Microwave Digestion of Alumina Powder in iPrep

Procedure
Add 0.1 g of the sample into the digestion vessel. Add 8 mL of H₃PO₄. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

Notes
This application can only be run in the iPrep vessel.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
H₃PO₄

Max Sample Weight
0.1 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, gold colored, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Aluminum Nitride

**Procedure**
Weigh 0.2 g of the sample into the digestion vessel. Add 5 mL H₃PO₄ and 10 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The addition of Conc. HCl (0-4 ml) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

**Reagents**
H₃PO₄
HCl

**Max Sample Weight**
0.2 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.  
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.  
c) The control / reference vessel must contain the largest and most reactive sample.  
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.  
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Aluminum Oxide

Procedure
Weigh 0.25 g of sample into the digestion vessel. Add 6.5 mL H₃PO₄ and 3.5 mL H₂SO₄. Gently swirl the vessel to thoroughly mix the sample and acid.

Notes
EasyPrep Plus requires a high temperature probe for this method.

Ensure that particles are well suspended in acid mixture prior to sealing vessel.

Stirring may be helpful to keep particles suspended in solution during digestion.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
H₃PO₄
H₂SO₄

Max Sample Weight
0.25 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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</tr>
</tbody>
</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Aluminum Oxide (H₃PO₄) in iPrep

Procedure
Weigh 0.1 g of the sample into the digestion vessel. Add 8 mL H₃PO₄. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

Notes
This application can only be run in the iPrep vessel.

This method may not provide a total digest of all samples. Hydrofluoric acid may be required to provide complete digestion of some sample matrixes.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
H₃PO₄

Max Sample Weight
0.1g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<tr>
<th>Stage</th>
<th>Temp (°C)</th>
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</table>

*Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear and colorless with some white particles remaining upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Asbestos

**Procedure**
Weigh 0.3 g of the sample into the digestion vessel. Add 6 mL of HCl, 3 mL of HNO₃, and 3 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
HF should be added slowly and carefully to the sample. Allow any initial reaction to subside before sealing vessel.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes.

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<thead>
<tr>
<th>Recommended Equipment</th>
<th>Recommended Vessels</th>
<th>Reagents</th>
</tr>
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<tr>
<td>MARS 6</td>
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<td>HCl</td>
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<tr>
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<th>Control Type</th>
<th>Method Type</th>
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<td>Organic</td>
<td>Ramp to Temperature</td>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Automotive Catalyst

**Procedure**

Weigh 0.4 g of the sample into the digestion vessel. Add 10 mL of HCl and 0.5 mL of HF. Gently swirl the mixture before closing the vessel.

**Notes**

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

Reducing the particle size increases the efficiency of digestion and may decrease the digestion time.

**Recommended Equipment**

MARS 6  
MARS 6 iWave

**Recommended Vessels**

EasyPrep  
EasyPrep Plus

**Reagents**

HCl  
HF

**Max Sample Weight**

0.4 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

<table>
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<tr>
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<th>*Ramp (mm:ss)</th>
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*Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.  
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.  
c) The control / reference vessel must contain the largest and most reactive sample.  
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.  
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Barium Titanate (BaTiO$_3$)

**Procedure**

Weigh 0.25 g of the sample into the digestion vessel. Add 5 mL of HNO$_3$ and 10 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

HF should be added slowly and carefully to the sample. Allow any initial reaction to subside before sealing vessel.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

<table>
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<th>Recommended Equipment</th>
<th>Recommended Vessels</th>
<th>Reagents</th>
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<tr>
<td>MARS 6</td>
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<td>HNO$_3$</td>
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<th>Sample Type</th>
<th>Control Type</th>
<th>Method Type</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Bastnaesite Ore (Step 1 of 2)

**Procedure**
Weigh 0.1 g of the sample into the digestion vessel. Add 9 mL of HCl and 3 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

This method could potentially form HF. It is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used.

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSXpress Plus

**Reagents**
- HCl
- HNO₃

**Max Sample Weight**
0.1 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.
Microwave Digestion of 
Bastnaesite Ore (Step 2 of 2)

Procedure
Allow vessels to cool. Open and add 1 g solid Boric Acid and 20 mL deionized H₂O. Wait approximately 15 minutes before closing the vessel.

Notes

Reagents
Solid Boric Acid
DI H₂O

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
<thead>
<tr>
<th>Stage</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as one touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Bauxite (Step 1 of 2)

**Procedure**
Weigh 0.25 g of the sample into the digestion vessel. Add 6.5 mL of H₃PO₄ and 3.5 mL of H₂SO₄. Gently swirl the mixture before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus

**Reagents**
- H₃PO₄
- H₂SO₄

**Max Sample Weight**
0.25 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

<table>
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* Ramp times and power may vary depending on the type and number of vessels.
Microwave Digestion of Bauxite (Step 2 of 2)

**Procedure**

Proceeding step 1 add 1 mL of HNO₃, 1 mL of HCl, and 1 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

**Reagents**

HNO₃  
HCl  
HF

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.  
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.  
c) The control / reference vessel must contain the largest and most reactive sample.  
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.  
e) If programming as one touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of 
Bismuth Aluminate Mixture

Procedure
Weigh 0.1 g of the sample into the digestion vessel. Add 9 mL HCl and 3 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Reagents
HCl
HNO₃

Max Sample Weight
0.1 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
Classic

Heating Program
<table>
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<tr>
<th>Stage</th>
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<th>Hold (mm:ss)</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Bismuth Yttrium Iron Oxide in iPrep (Step 1 of 2)

**Procedure**

Weigh 0.1 g of the sample into the digestion vessel. Add 6 mL of HCl, 2 mL of HNO₃, and 0.5 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel. Allow any initial reaction to subside before sealing vessel.

**Notes**

This application can only be run in the iPrep vessel.

HF should be added slowly and carefully to the sample.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used.

**Recommended Equipment**

MARS 6 iWave

**Recommended Vessels**

iPrep

**Reagents**

HCl
HNO₃
HF

**Max Sample Weight**

0.1 g

**Sample Type**

HCl

**Control Type**

Ramp to Temperature

**Method Type**

Classic

**Heating Program**

<table>
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<th>Stage</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.
Microwave Digestion of Bismuth Yttrium Iron Oxide in iPrep (Step 2 of 2)

**Procedure**

Allow vessel to cool. Add 1.75 g of solid H$_3$BO$_3$ + 20 mL deionized H$_2$O into the vessel that contains the sample and acid.

**Notes**

This procedure can be used if it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed by reaction of certain analytes with hydrofluoric acid.

**Reagents**

- Solid H$_3$BO$_3$
- DI H$_2$O

**Sample Type**

Standard

**Control Type**

Ramp to Temperature

**Method Type**

Classic

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, yellow in color, and particle free upon dilution to 50 mL.

**General Precaution**

a) If using HF, follow restrictions listed in HF Addendum.

b) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

d) If programming as one touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Boiler Scale (80-90% Fe)

Procedure
Weigh 0.25 g of the sample into the digestion vessel. Add 5 mL of HNO₃ and 5 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 ml) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HNO₃
HCl

max Sample Weight
0.25 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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<th>Hold (mm:ss)</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Boric Acid HF Neutralization

Procedure
Allow vessel to cool. Add 30 mL H₃BO₃ (4%) into the vessel that contains the sample and acid.

Notes
This procedure can be used if it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed by reaction of certain analytes with hydrofluoric acid. Alternatively, 1-4 g of solid H₃BO₃ + 25 mL deionized H₂O can be used in place of the 4% w/v solution.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress Plus

Recommended Vessels
MARS 6
MARS 6 iWave

Reagents
H₃BO₃ (4%)

Max Sample Weight
Varies by Sample

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<tr>
<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
See sample specific method notes.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Boron Carbide (B₄C) in iPrep

Procedure
Weigh 0.2 g of the sample into the digestion vessel. Add 5 mL of HNO₃ and 5 mL of H₂SO₄. Gently swirl to mix the sample particles in the acid. Slowly and carefully add 5 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Allow any initial reaction to subside before sealing vessel.

Notes
This application can only be run in the iPrep vessel.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

Reducing the particle size increases the efficiency of digestion and may decrease the digestion time.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HNO₃
H₂SO₄
HF

Max Sample Weight
0.2 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Carbon

**Procedure**
Weigh 0.1 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The structure, form and surface area of carbon samples varies widely. Higher temperatures and use of other reagents may be necessary in order to digest certain samples.

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus

**Reagents**
HNO₃

**Max Sample Weight**
0.1 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

<table>
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<tr>
<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Cement

**Procedure**

Weigh 0.3 g of the sample into the digestion vessel. Add 3 mL of HNO₃, 6 mL of HCL, and 3 mL of HF. Gently swirl the mixture before closing the vessel.

**Notes**

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

MARS 6
MARS 6 iWave

**Recommended Vessels**

EasyPrep
EasyPrep Plus

**Reagents**

HNO₃
HCl
HF

**Max Sample Weight**

0.3 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

<table>
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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Ceramic (Fused Silica)

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Slowly add 2 mL of HNO₃, and 8 mL of HF. Gently swirl the mixture before closing the vessel.

**Notes**

HF should be added slowly and carefully to the sample. Allow any initial reaction to subside before sealing the vessel.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus

**Reagents**

- HNO₃
- HF

**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
**Microwave Digestion of Ceramics**

**Procedure**

Weigh 0.2 g of the sample into the digestion vessel. Add 5 mL of HNO₃, and 5 ml of HF. Gently swirl the mixture before closing the vessel.

**Notes**

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

MARS 6
MARS 6 iWave

**Recommended Vessels**

EasyPrep
EasyPrep Plus

**Reagents**

HNO₃
HF

**Max Sample Weight**

0.2 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

<table>
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*Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Char - Sulfuric Acid

**Procedure**
Add 6 mL H₂SO₄ into the vessel that contains the sample and acid.

**Notes**
EasyPrep Plus requires a high temperature probe for this method.

This method is for the pretreatment of large sample sizes or difficult organic samples that are resistant to oxidation. After the char is complete, the vessel is opened and a normal oxidation with HNO₃ can be run, usually at around 200°C.

### Recommended Equipment
MARS 6
MARS 6 iWave

### Recommended Vessels
EasyPrep
EasyPrep Plus

### Reagents
H₂SO₄

### Max Sample Weight
Varies by sample

### Sample Type
Organic

### Control Type
Ramp to Temperature

### Method Type
One Touch

### Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

### Results
See sample specific method notes.

### General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Chromium Carbide

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃ and 10 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides.

**Notes**
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

**Recommended Equipment**
MARS 6  
MARS 6 iWave

**Recommended Vessels**
EasyPrep  
EasyPrep Plus

**Reagents**
HNO₃  
HF

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Chromium Oxide (Cr\textsubscript{2}O\textsubscript{3}) in iPrep

**Procedure**
Weigh 50 mg of the sample into the digestion vessel. Insert stir bar into the vessel. Add 4.5 mL of H\textsubscript{2}SO\textsubscript{4} and 4 mL of HNO\textsubscript{3} to the vessel, then 1.5 mL of H\textsubscript{2}O\textsubscript{2} (30%) dropwise. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
This application can only be run in the iPrep vessel.
Stirring is required for complete dissolution of this sample type.

**Recommended Equipment**
MARS 6 iWave

**Recommended Vessels**
iPrep

**Reagents**
H\textsubscript{2}SO\textsubscript{4} 
HNO\textsubscript{3} 
H\textsubscript{2}O\textsubscript{2} (30%)

**Max Sample Weight**
50 mg

**Sample Type**
Standard

**Control Type**
Ramp to Temperature

**Method Type**
Classic

**Heating Program**

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*Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear and turquoise colored upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Clay

Procedure
Weigh 0.2 g of the sample into the digestion vessel. Add 3 mL of HNO₃, 1 mL of HCl, and 5 ml of HF. Gently swirl the mixture before closing the vessel.

Notes
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

The addition of Conc. HCl (0-4 Ml) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HF
HNO₃
HCl

Max Sample Weight
0.2 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
<th>Temp (°C)</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Coal in iPrep

Procedure
Weigh 0.2 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

Notes
This application can only be run in the iPrep vessel.

The use of HF may be required to digest any silicates found in the sample.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HNO₃

Max Sample Weight
0.2 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless with some particles remaining upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Coal

Procedure
Weigh 0.1 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The use of HF may be required to digest any silicates found in the sample.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HNO₃

Max Sample Weight
0.1 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
**Microwave Digestion of Coal Ash**

**Procedure**
Weigh 0.3 g of the sample into the digestion vessel. Add 3 mL of HNO₃, 3 mL of HCl and 3 mL of HF. Gently swirl the mixture before closing the vessel.

**Notes**
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

The addition of Conc. HCl (0-4mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus

**Reagents**
- HNO₃
- HCl
- HF

**Max Sample Weight**
0.3 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Cryolite / Electrolytic Bath (Step 1 of 2)

**Procedure**
Weigh 0.5g of the sample into the digestion vessel. Add 10 mL HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
Cryolite / Electrolytic Bath is approximately 55% Cryolite (Na₃AlF₆) and 30% Chiolite (Na₅Al₃F₁₄).

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus

**Reagents**
- HNO₃

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.
Microwave Digestion of Cryolite / Electrolytic Bath (Step 2 of 2)

Procedure
Allow vessel to cool after completion of Step 1. Open and add 30 mL of Deionized Water and 2 g Boric Acid (solid). Gently swirl the mixture and seal the vessel.

Notes

Reagents
DI $\text{H}_2\text{O}$
Boric Acid (solid)

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as one touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Feldspar in iPrep (Step 1 of 2)

Procedure
Weigh 0.25 g of the sample into the digestion vessel. Add 2 mL of HCl and 8 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides.

Notes
This application can only be run in the iPrep vessel.

This procedure uses hydrofluoric acid. It is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HCl
HF

Max Sample Weight
0.25 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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*Ramp times and power may vary depending on the type and number of vessels.
Microwave Digestion of Feldspar (Step 2 of 2)

**Procedure**

Allow vessels to cool. Open and add 4 g solid boric acid and 30 mL of deionized H2O. Wait approximately 15 minutes before closing the vessel.

**Notes**

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

d) If programming as one touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Ferric Oxide in iPrep

**Procedure**
Weigh 0.1 g of the sample into the digestion vessel. Add 10 mL of a 1:1:1 HCl, HNO₃, and Deionized H₂O mixture. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
This application can only be run in the iPrep vessel.

**Recommended Equipment**
MARS 6 iWave

**Recommended Vessels**
iPrep

**Reagents**
HCl
HNO₃
DI H₂O

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<th>Sample Type</th>
<th>Control Type</th>
<th>Method Type</th>
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**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, yellow in color, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
**Microwave Digestion of Furnace Slag**

**Procedure**
Add 0.5 g of the sample into the digestion vessel. Add 3 mL of HNO₃, 2 mL of HCl, and 5 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

HF should be added slowly and carefully to the sample. Allow any initial reaction to subside before sealing vessel.

**Notes**
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used.

This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”. The addition of Conc. HCl (0-4 ml) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

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<tr>
<th>Recommended Equipment</th>
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<td>EasyPrep Plus</td>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Gadolinium Zirconium Oxide in iPrep (Step 1 of 2)

Procedure
Weigh 0.1 g of the sample into the digestion vessel. Add 4 mL of H₂SO₄, 1.5 mL of HNO₃ and 1.5 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel. Allow any initial reaction to subside before sealing vessel.

Notes
This application can only be run in the iPrep vessel.

HF should be added slowly and carefully to the sample.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
H₂SO₄, HNO₃, HF

Max Sample Weight
0.1 g

Sample Type
Standard

Control Type
Ramp to Temperature

Method Type
Classic

Heating Program

<table>
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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.
Microwave Digestion of Gadolinium Zirconium Oxide in iPrep (Step 2 of 2)

Procedure
Allow vessel to cool. Add 1.5 g of solid H$_3$BO$_3$ + 20 mL deionized H$_2$O into the vessel that contains the sample and acid.

Notes
This procedure can be used if it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed by reaction of certain analytes with hydrofluoric acid.

Reagents
H$_3$BO$_3$
DI H$_2$O

Sample Type  Control Type  Method Type
Standard  Ramp to Temperature  Classic

Heating Program

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<tr>
<th>Stage</th>
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<th>*Ramp (mm:ss)</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) If using HF, follow restrictions listed in HF Addendum.

b) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

d) If programming as one touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Gas Atomized Powder in iPrep

Procedure
Weigh 0.1 g of the sample into the digestion vessel. Add 8 mL of HNO₃, 2 mL of HCl, and 1 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
This application can only be run in the iPrep vessel.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HNO₃
HCl
HF

Max Sample Weight
0.1 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Samples were clear, green in color and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
e) If using HF, follow restrictions listed in HF Addendum.
Microwave Digestion of Glass Fiber

**Procedure**

Add 0.4 g of the sample into the digestion vessel. Add 2 mL of HNO₃, 4 mL of HCl, and 4 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

HF should be added slowly and carefully to the sample. Allow any initial reaction to subside before sealing vessel.

**Notes**

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used.

This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization". The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus

**Reagents**

- HNO₃
- HCl
- HF

**Max Sample Weight**

0.4 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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*Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Hafnium Oxide

**Procedure**
Add 0.25 g of the sample into the digestion vessel. Add 10 mL of HNO₃:HCl:HF (1:1:1) or alternatively, HNO₃:H₂O:HF (1:1:1). (See Notes) Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

HF should be added slowly and carefully to the sample. Allow any initial reaction to subside before sealing vessel. HNO₃:H₂O:HF (1:1:1) can be substituted for HNO₃:HCl:HF (1:1:1) using the same heating program if the use of HCl is not desired. Mixtures are made from acids in their concentrated form.

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus

**Reagents**
HNO₃
HCl or H₂O
HF

**Max Sample Weight**
0.25 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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<th>Temp (°C)</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Ilmenite (FeTiO₃)

**Procedure**
Weigh 0.25 g of the sample into the digestion vessel. Add 5 mL of HNO₃, 1 mL of HCl, and 10 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

HF should be added slowly and carefully to the sample. Allow any initial reaction to subside before sealing vessel.

**Notes**
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes.

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus

**Reagents**
HNO₃
HCl
HF

**Max Sample Weight**
0.25 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

<table>
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*Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Iron Ore

**Procedure**

Weigh 1 g of the sample into the digestion vessel. Add 4 mL of H₂O, 8 ml of HCl, 4 mL of HNO₃, and 4 mL of HF. Gently swirl the mixture and wait approximately 15 minute before closing the vessel.

**Notes**

The above procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric HF Neutralization”

The addition of Conc. HCl (0-8 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus

**Reagents**

- H₂O
- HCl
- HNO₃
- HF

**Max Sample Weight**

- 1.0 g

**Sample Type**

- Organic

**Control Type**

- Ramp to Temperature

**Method Type**

- One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Kaolin

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 3 mL of HCl, 1 mL of HNO₃, and 7 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

HF should be added slowly and carefully to the sample. Allow any initial reaction to subside before sealing vessel.

**Notes**
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes.

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus

**Reagents**
- HCl
- HNO₃
- HF

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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*Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Kerosene

Procedure

Weigh 0.25 g of the sample into the digestion vessel. Add 10 mL of HNO$_3$. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

Notes

The pre-digestion step will allow the lighter fuel fractions to react before sealing the vessels.

Recommended Equipment

- MARS 6
- MARS 6 iWave

Recommended Vessels

- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

Reagents

- HNO$_3$

Max Sample Weight

0.25 g

Sample Type

Organic

Control Type

Ramp to Temperature

Method Type

One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results

Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Lead Sulfide (PbS)

**Procedure**
Weigh 0.1 g of the sample into the digestion vessel. Add 5 mL of HNO₃ and 5 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The addition of Conc. HCl (0-4 ml) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus

**Reagents**
- HNO₃
- HCl

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<th>Control Type</th>
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**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Lithium Nickel Cobalt Manganese Oxide

Procedure
Weigh 0.1 g of the sample into the digestion vessel. Add 4 mL of HNO₃ and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 ml) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
MARSXpress

Reagents
HNO₃
HCl

Max Sample Weight
0.1 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
The samples were clear, green in color, and particle free upon dilution.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Magnesium Oxide (MgO 40-54%)

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 5 mL of DI H₂O, 5 mL HCl, and 5 mL HNO₃. Gently swirl and allow approximately 15 minutes for pre-digestion.

**Notes**
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

**Reagents**
H₂O (deionized)
HCl
HNO₃

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Manganous Oxide (MnO) (Step 1 of 2)

Procedure
Weigh 0.2g of the sample into the digestion vessel. Add 10 mL HNO₃ and 3 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

HF should be added slowly and carefully to the sample. Allow any initial reaction to subside before sealing vessel.

Notes
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HNO₃
HF

Max Sample Weight
0.2 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.
Microwave Digestion of Manganous Oxide (MnO) (Step 2 of 2)

**Procedure**

Allow vessel to cool after completion of Step 1. Open and add 5 mL of HCl. Gently swirl the mixture and seal the vessel.

**Notes**

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Reagents**

HCl

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as one touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Mica in iPrep

Procedure
Weigh 0.1 g of the sample into the digestion vessel. Add 4 mL of $H_3PO_4$, 3 mL of HCl, and 0.5 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
This application can only be run in the iPrep vessel.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes.

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
e) If using HF, follow restrictions listed in HF Addendum.
## Microwave Digestion of Mill Tailings (Step 1 of 2)

### Procedure

Weigh 0.25 g of the sample into the digestion vessel. Add 3 mL of H₃PO₄, and 2 mL of H₂SO₄. Gently swirl the mixture before closing the vessel.

### Notes

EasyPrep Plus vessels require a high temperature probe for this method.

### Recommended Equipment

- MARS 6
- MARS 6 iWave

### Recommended Vessels

- EasyPrep
- EasyPrep Plus

### Reagents

- H₃PO₄
- H₂SO₄

### Max Sample Weight

0.25 g

### Sample Type

Organic

### Control Type

Ramp to Temperature

### Method Type

One Touch

### Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.
Microwave Digestion of Mill Tailings (Step 2 of 2)

Procedure
Cool, vent and open vessel after step 1. Add 2.5 mL HNO₃, 2.5 mL HCl, 2.5 mL HF, and 2.5 ml H₂O.

HF should be added slowly and carefully to the sample. Allow any initial reaction to subside before sealing the vessel.

Notes
The above procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in method note entitled "Boric HF Neutralization"
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Reagents
HNO₃
HCl
HF
H₂O

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as one touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Mineral Ore (Step 1 of 2)

Procedure

Weigh 0.3 g of the sample into the digestion vessel. Add 3 mL of HNO₃, 3 mL of HCl, and 3 mL of HF. Gently swirl the mixture before closing the vessel.

Notes

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

Recommended Equipment

- MARS 6
- MARS 6 iWave

Recommended Vessels

- EasyPrep
- EasyPrep Plus

Reagents

- HNO₃
- HCl
- HF

Max Sample Weight

0.3 g

Sample Type

Organic

Control Type

Ramp to Temperature

Method Type

One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.
Microwave Digestion of Mineral Ore (Step 2 of 2)

Procedure
Proceeding step 1 add 25 mL of Boric Acid (4%). Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Reagents
H₃BO₃ (4%)

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as one touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Molybdenum Disulfide (MoS$_2$) (Step 1 of 2)

**Procedure**
Add 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO$_3$. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

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<td>HNO$_3$</td>
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* Ramp times and power may vary depending on the type and number of vessels.
Microwave Digestion of Molybdenum Disulfide (MoS$_2$) (Step 2 of 2)

**Procedure**
Allow vessel to cool after completion of Step 1. Add 10 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Reagents**
HCl

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as one touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of 
**Nickel (II) Hydroxide**

**Procedure**
Weigh 0.1 g of the sample into the digestion vessel. Add 4 mL of HNO₃ and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The addition of Conc. HCl (0-4 ml) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
MARSXpress

**Reagents**
HNO₃
HCl

**Max Sample Weight**
0.1 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
The samples were clear, light green in color, and particle free upon dilution.

**General Precaution**
- a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
- b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
- c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
- d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Niobium Pentoxide

**Procedure**

Add 1.0 g of the sample into the digestion vessel. Add 2 mL of HNO₃, and 10 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

HF should be added slowly and carefully to the sample. Allow any initial reaction to subside before sealing vessel.

**Notes**

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

**Recommended Equipment**

MARS 6  
MARS 6 iWave

**Recommended Vessels**

EasyPrep  
EasyPrep Plus

**Reagents**

HNO₃  
HF

**Max Sample Weight**

1.0 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
## Microwave Digestion of Petroleum Coke (Step 1 of 2)

### Procedure
Weigh 0.1 g of the sample into the digestion vessel. Add 10 mL of $\text{H}_2\text{SO}_4$. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

### Notes

### Recommended Equipment
- MARS 6
- MARS 6 iWave

### Recommended Vessels
- EasyPrep
- EasyPrep Plus

### Reagents
- $\text{H}_2\text{SO}_4$

### Max Sample Weight
0.1 g

### Sample Type
Organic

### Control Type
Ramp to Temperature

### Method Type
One Touch

### Heating Program

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*Ramp times and power may vary depending on the type and number of vessels.*
Microwave Digestion of Petroleum Coke (Step 2 of 2)

Procedure
Proceeding step 1 add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Reagents
HNO₃

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
**Microwave Digestion of Phosphate (21%)**

**Procedure**
Weigh 0.25 g of the sample into the digestion vessel. Add 5 mL of H$_2$O$_2$ (30%), 5 mL HCl dropwise (wait for reaction to subside before adding next acid), and 5 mL HNO$_3$. Gently swirl the mixture and wait approximately 1 hour before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**
- H$_2$O$_2$ (30%)
- HCl
- HNO$_3$

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**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Phosphate Rock

Procedure
Add 0.5 g of the sample into the digestion vessel. Add 5 mL of HNO₃, 5 mL of HBF₄. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus

Reagents
- HNO₃
- HBF₄

Max Sample Weight
- 0.5 g

Sample Type
- Organic

Control Type
- Ramp to Temperature

Method Type
- One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of 
Pollucite Ore in iPrep (Step 1 of 2)

Procedure
Weigh 0.1 g of the sample into the digestion vessel. Add 3 mL of HNO₃ and 5 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

Recommended Equipment
- MARS 6 iWave

Recommended Vessels
- iPrep

Reagents
- HNO₃
- HF

Max Sample Weight
- 0.1 g

Sample Type
- Organic

Control Type
- Ramp to Temperature

Method Type
- One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.
Microwave Digestion of Pollucite Ore in iPrep (Step 2 of 2)

Procedure
Allow vessel to cool. Add 2.5 g H₃BO₃ and 25 mL of deionized H₂O into the vessel that contains the sample and acid.

Notes
This procedure can be used if it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed by reaction of certain analytes with hydrofluoric acid.

Reagents
H₃BO₃
DI H₂O

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear and particle free upon dilution to 50 mL.

General Precaution
a) If using HF, follow restrictions listed in HF Addendum.
b) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
c) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as one touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Pyrophyllite (AlSi$_2$)$_5$(OH)

**Procedure**
Add 0.25 g of the sample into the digestion vessel. Add 3 mL of HNO$_3$, 1 mL of HCl, and 7 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

HF should be added slowly and carefully to the sample. Allow any initial reaction to subside before sealing vessel.

**Notes**
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

The addition of Conc. HCl (0-4 ml) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus

**Reagents**
HNO$_3$
HCl
HF

**Max Sample Weight**
0.25 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Procedure
Weigh 1 g of the sample into the digestion vessel. Add 10 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

HF should be added slowly and carefully to the sample. Allow any initial reaction to subside before sealing vessel.

Notes
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HF

Max Sample Weight
1.0 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Rock (Pulverized)

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 5 mL of HNO₃, 3 mL of HCl, and 3 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HCl
HF
HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Rock, High Sulfide in iPrep (Step 1 of 2)

**Procedure**
Weigh 0.25 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture before closing the vessel.

**Notes**
This application can only be run in the iPrep vessel.

**Recommended Equipment**
MARS 6 iWave

**Recommended Vessels**
iPrep

**Reagents**
HNO₃

**Max Sample Weight**
0.25 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

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* Ramp times and power may vary depending on the type and number of vessels.
Microwave Digestion of 
Rock, High Sulfide in iPrep (Step 2 of 2)

Procedure
Proceeding step 1 add 3 mL of HF, and 2 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes.

Reagents
HF
HCl

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL

General Precaution
a) If using HF, follow restrictions listed in HF Addendum.
b) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
c) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
d) The control / reference vessel must contain the largest and most reactive sample.
e) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
Microwave Digestion of Rutile Ore

**Procedure**

Weigh 0.25 g of the sample into the digestion vessel. Add 4 mL of HNO₃, 3 mL of H₃PO₄, and 8 mL of HF. Gently swirl the mixture before closing the vessel.

**Notes**

The above procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric HF Neutralization”

**Recommended Equipment**

MARS 6
MARS 6 iWave

**Recommended Vessels**

EasyPrep
EasyPrep Plus

**Reagents**

HNO₃
HF
H₃PO₄

**Max Sample Weight**

0.25 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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*Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 ml.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Sand

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 3 mL of HNO₃, 2 mL of HCl, and 5 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The above procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric HF Neutralization”.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HNO₃
HF
HCl

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Shale in iPrep

**Procedure**

Weigh 0.5 g of sample into the digestion vessel. Add 7 mL of HF, 3 mL of HNO₃, and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

This application can only be run in the iPrep vessel.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes.

**Recommended Equipment**

MARS 6 iWave

**Recommended Vessels**

iPrep

**Reagents**

HF
HNO₃
HCl

**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.

e) If using HF, follow restrictions listed in HF Addendum.
Microwave Digestion of Silica Sand

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 5 mL of H₂O, 3 mL of HNO₃, and 8 mL of HF. Gently swirl the mixture before closing the vessel.

**Notes**

Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides. The above procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric HF Neutralization.” Reducing the particle size increases the efficiency of digestion and may decrease the digestion time.

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus

**Reagents**

- H₂O
- HNO₃
- HF

**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

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*Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Silica Sand in iPrep

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 2 mL of HCl and 8 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides.

Notes
This application can only be run in the iPrep vessel.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HCl
HF

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
The sample was clear, colorless and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
e) If using HF, follow restrictions listed in HF Addendum.
Microwave Digestion of Silicon Dioxide

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 2 mL of HNO₃, and 8 mL of HF. Gently swirl the mixture before closing the vessel.

Notes
Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides.

The above procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric HF Neutralization”

Reducing the particle size increase the efficiency of digestion and may decrease the digestion time.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HNO₃
HF

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Silicon Nitride in iPrep

Procedure
Add 0.1 g of the sample into the digestion vessel. Add 1 mL of HNO₃ and 5 mL HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides.

Notes
This application can only be run in the iPrep vessel.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HNO₃
HF

Max Sample Weight
0.1 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.

e) If using HF, follow restrictions listed in HF Addendum.
Microwave Digestion of 
Silicon Wafer

Procedure
Add 1 piece (approx. 0.5 g) of the sample into the digestion vessel. Add 6 mL of HF and 3 mL of HNO3. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides.

Notes
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HNO3
HF

Max Sample Weight
1 Piece (Approx 0.5 g)

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Slag - Furnace

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 3 mL of HNO₃, 5 mL of HCl, and 5 mL of HF. Gently swirl the mixture before closing the vessel.

**Notes**

The above procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric HF Neutralization”

The addition of Conc. HCl (0-4mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

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**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Sodium Antimonate in iPrep

**Procedure**

Weigh 0.5 g of sample into the digestion vessel. Add 10 mL of HCl, 3 mL of HNO₃, and 2 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

This application can only be run in the iPrep vessel.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes.

**Recommended Equipment**

MARS 6 iWave

**Recommended Vessels**

iPrep

**Reagents**

HCl
HNO₃
HF

**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.

e) If using HF, follow restrictions listed in HF Addendum.
Microwave Digestion of Spodumene (Lithium Feldspar) (Step 1 of 2)

Procedure
Weigh .25 g of the sample into the digestion vessel. Add 3 mL of HCl, 1 mL of HNO₃ and 4 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

HF should be added slowly and carefully to the sample. Allow any initial reaction to subside before sealing vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HCl
HNO₃
HF

Max Sample Weight
0.25 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.
Microwave Digestion of Spodumene (Lithium Feldspar) (Step 2 of 2)

Procedure
Allow vessel to cool after completion of Step 1. Open and add 30 mL of Deionized H$_2$O and 2 g H$_3$BO$_3$ (solid). Gently swirl the mixture and seal the vessel.

Notes

Reagents
Deionized H$_2$O
H$_3$BO$_3$ (solid)

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as one touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Sulfide Bulk Concentrate in iPrep (Step 1 of 2)

**Procedure**

Weigh 0.25 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture before closing the vessel.

**Notes**

This application can only be run in the iPrep vessel.

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<th>Recommended Vessels</th>
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* Ramp times and power may vary depending on the type and number of vessels.
Microwave Digestion of
Sulfide Bulk Concentrate in iPrep (Step 2 of 2)

Procedure
Proceeding step 1 add 5 mL of HCl, and 5 mL of Deionized Water. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Reagents
HCl
DI H₂O

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
Microwave Digestion of Tantalum Pentoxide (Ta$_2$O$_5$) in iPrep

**Procedure**
Weigh 0.5 g of sample into the digestion vessel. Add 3 mL of HNO$_3$, and 7 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
This application can only be run in the iPrep vessel.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

**Recommended Equipment**
MARS 6 iWave

**Recommended Vessels**
iPrep

**Reagents**
HNO$_3$, HF

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.

e) If using HF, follow restrictions listed in HF Addendum.
Microwave Digestion of Titanium Dioxide

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃ and 2 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

**Recommended Equipment**
MARS 6  
MARS 6 iWave

**Recommended Vessels**
EasyPrep  
EasyPrep Plus

**Reagents**
HNO₃  
HF

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.  
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.  
c) The control / reference vessel must contain the largest and most reactive sample.  
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.  
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of 
Titanium Slag Ore in iPrep

**Procedure**
Weigh 0.25 g of sample into the digestion vessel. Add 5 mL of HNO₃, and 10 mL of HF. HF should be added slowly and carefully to the sample. Allow any initial reaction to subside before sealing the vessel.

Reducing the particle size increases the efficiency of digestion and may decrease the digestion time.

**Notes**
This application can only be run in the iPrep vessel.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

**Recommended Equipment**
MARS 6 iWave

**Recommended Vessels**
iPrep

**Reagents**
HNO₃, HF

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**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
e) If using HF, follow restrictions listed in HF Addendum.
Microwave Digestion of Tungsten Carbide

Procedure
Weigh 0.25 g of the sample into the digestion vessel. Slowly add 5 mL of HNO₃, and 10 mL of HF. Gently swirl the mixture before closing the vessel.

Notes
Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides.

The above procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled "Boric HF Neutralization".

Reducing the particle size increase the efficiency of digestion and may decrease the digestion time.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HNO₃
HF

Max Sample Weight
0.25 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Tungsten Ore (50% W; 10% Fe; 2% Mn)

Procedure
Weigh 0.2 g of the sample into the digestion vessel. Add 9 mL of HCl and 1 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

HF should be added slowly and carefully to the sample. Allow any initial reaction to subside before sealing vessel.

Notes
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

The addition of Conc. HCl (0-4 ml) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus

Reagents
- HCl
- HF

Max Sample Weight
0.2 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Tungsten Oxide

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Slowly add 2 mL of HNO₃, and 7 mL of HF. Gently swirl the mixture before closing the vessel.

**Notes**

Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides.

The above procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric HF Neutralization.”

Reducing the particle size increase the efficiency of digestion and may decrease the digestion time.

**Recommended Equipment**

MARS 6
MARS 6 iWave

**Recommended Vessels**

EasyPrep
EasyPrep Plus

**Reagents**

HNO₃
HF

**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

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*Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Vermiculite

Procedure
Add 0.25 g of the sample into the digestion vessel. Add 1 mL of HNO₃, 4 mL of HCl, and 10 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

HF should be added slowly and carefully to the sample. Allow any initial reaction to subside before sealing vessel.

Notes
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

The addition of Conc. HCl (0-4 ml) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HNO₃
HCl
HF

Max Sample Weight
0.25 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Wollastonite (Calcium Silicate) in iPrep

Procedure
Weigh 0.1 g of sample into the digestion vessel. Add 3 mL of $H_3PO_4$, 2 mL of $HNO_3$, and 3 mL of $HBF_4$. $HBF_4$ should be added slowly and carefully to the sample. Allow any initial reaction to subside before sealing the vessel.

Notes
This application can only be run in the iPrep vessel.

Recommended Equipment
- MARS 6 iWave

Recommended Vessels
- iPrep

Reagents
- $H_3PO_4$
- $HNO_3$
- $HBF_4$

Max Sample Weight
0.1 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Zeolite

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 5 mL of HNO$_3$, 4 mL of HCl, and 2 mL of HF. Gently swirl the mixture before closing the vessel.

**Notes**
Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides.

The above procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric HF Neutralization”

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus

**Reagents**
- HNO$_3$
- HF

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of

Zinc Oxide (ZnO)

**Procedure**
Weigh 0.1 g of the sample into the digestion vessel. Add 5 mL of HNO₃ and 2 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel. HF should be added slowly and carefully to the sample. Allow any initial reaction to subside before sealing vessel.

**Notes**
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

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<td>MARS 6</td>
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<td>HNO₃</td>
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<tr>
<td>MARS 6 iWave</td>
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**Max Sample Weight**
0.1 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

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*Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Zinc Oxide (ZnO) in iPrep

**Procedure**
Weigh 0.25 g of the sample (onto a filter disk) into the digestion vessel. Add 5 mL HNO₃ and 2 mL HF. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

**Notes**
This application can only be run in the iPrep vessel.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

**Recommended Equipment**
MARS 6 iWave

**Recommended Vessels**
iPrep

**Reagents**
HNO₃
HF

**Max Sample Weight**
0.25 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
<th>Pressure (psi)</th>
<th>* Power (W)</th>
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<tbody>
<tr>
<td>1</td>
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<td>15:00</td>
<td>N/A</td>
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</tr>
</tbody>
</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
e) If using HF, follow restrictions listed in HF Addendum.
Microwave Digestion of Zircon in iPrep

Procedure
Add 50 mg of the sample into the digestion vessel. Add 4 mL of H$_2$SO$_4$, 1.5 mL of HNO$_3$, and 1.5 mL HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides.

Notes
This application can only be run in the iPrep vessel.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
H$_2$SO$_4$
HNO$_3$
HF

Max Sample Weight
50 mg

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
<th>Pressure (psi)</th>
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<td>700-1800</td>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
e) If using HF, follow restrictions listed in HF Addendum.
Industrial Hygiene
Microwave Digestion of Asbestos

Procedure
Weigh 0.3 g of the sample into the digestion vessel. Add 6 mL of HCl, 3 mL of HNO₃, and 3 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
HF should be added slowly and carefully to the sample. Allow any initial reaction to subside before sealing vessel.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes.

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus

Reagents
- HCl
- HNO₃
- HF

Max Sample Weight
0.3 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
<th>Pressure (psi)</th>
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<td>15:00</td>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
**Microwave Digestion of Filter (MCE)**

**Procedure**
Weigh one 37mm filter and one 25 mm filter (60 mg total) into the digestion vessel. Add 1 mL of HCl and 1 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
This method was completed in the 20 mL disposable liner.

**Recommended Equipment**
- MARS 6 iWave

**Recommended Vessels**
- 20 mL MARSXpress

**Reagents**
- HCl
- HNO₃

**Max Sample Weight**
- 60 mg

**Sample Type**
- Organic

**Control Type**
- Ramp to Temperature

**Method Type**
- One Touch

**Heating Program**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Filter Paper - 37 mm Mixed Cellulose Ester

Procedure
Weigh 1 filter (approx 0.3 g) into the digestion vessel. Add 10 mL HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Max Sample Weight
1 Filter (Approx 0.3 g)

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
<th>Pressure (psi)</th>
<th>* Power (W)</th>
<th>Stirring</th>
</tr>
</thead>
<tbody>
<tr>
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<td>800</td>
<td>900-1800</td>
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</tbody>
</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Filter Paper - 47 mm Polycarbonate

**Procedure**

Weigh 1 filter (approx 0.4 g) into the digestion vessel. Add 10 mL HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

MARS 6
MARS 6 iWave

**Recommended Vessels**

EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

**Reagents**

HNO₃

**Max Sample Weight**

1 Filter (Approx 0.4 g)

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
<th>Pressure (psi)</th>
<th>* Power (W)</th>
<th>Stirring</th>
</tr>
</thead>
<tbody>
<tr>
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<td>200</td>
<td>15:00</td>
<td>15:00</td>
<td>800</td>
<td>900-1800</td>
<td>Off</td>
</tr>
</tbody>
</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Filter Paper - Cellulose

Procedure
Weigh 1 filter (approx 0.9 g) of the sample into the digestion vessel. Add 5 mL of H₂O, and 5 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
Add H₂O before HNO₃.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Equipment
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Recommended Vessels

Reagents
H₂O
HNO₃

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Max Sample Weight
1 Filter (Approx 0.9 g)

Heating Program

<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
<th>Pressure (psi)</th>
<th>* Power (W)</th>
<th>Stirring</th>
</tr>
</thead>
<tbody>
<tr>
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<td>15:00</td>
<td>10:00</td>
<td>800</td>
<td>900-1800</td>
<td>Off</td>
</tr>
</tbody>
</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.

Add H₂O before HNO₃.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.
Microwave Digestion of Ghost Wipe

Procedure
Weigh 1 wipe (approx 2.5 g) into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
Ensure that the entire wipe is covered with reagent.

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

Reagents
- HNO₃

Max Sample Weight
1 Wipe (Approx 2.5 g)

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
<th>Pressure (psi)</th>
<th>* Power (W)</th>
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<td>15:00</td>
<td>800</td>
<td>900-1800</td>
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</tbody>
</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
**Microwave Digestion of Paint Chips (For Pb Analysis)**

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture before closing the vessel.

**Notes**
HF may be required for a total dissolution.

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

**Reagents**
- HNO₃

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
<th>Pressure (psi)</th>
<th>* Power (W)</th>
<th>Stirring</th>
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<td>15:00</td>
<td>10:00</td>
<td>800</td>
<td>900-1800</td>
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</tbody>
</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, with some remaining inorganic particles upon dilution to 50 mL.

**General Precaution**
- a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
- b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
- c) The control / reference vessel must contain the largest and most reactive sample.
- d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
- e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Quartz Fiber Filters

Procedure
Weigh 1 filter (approximately 0.35 g) of the sample into the digestion vessel. Add 8 mL of HNO₃ and 2 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
This method should not exceed 180 degrees celsius.

This application should only be completed using the 75 mL Xpress or 110 mL Xpress Plus vessels. It is not suitable for the smaller Xpress vessels (55 mL, 20 mL, or 10 mL).

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

<table>
<thead>
<tr>
<th>Recommended Equipment</th>
<th>Recommended Vessels</th>
<th>Reagents</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARS 6</td>
<td>MARS Xpress</td>
<td>HNO₃</td>
</tr>
<tr>
<td>MARS 6 iWave</td>
<td>MARS Xpress Plus</td>
<td>HF</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Max Sample Weight</th>
<th>Sample Type</th>
<th>Control Type</th>
<th>Method Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.35 g (1 filter)</td>
<td>Organic</td>
<td>Ramp to Temperature</td>
<td>One Touch</td>
</tr>
</tbody>
</table>

| Heating Program |
|-----------------|-----------------|------------------------|-------------|
| Stage | Temp (°C) | *Ramp (mm:ss) | Hold (mm:ss) | Pressure (psi) | * Power (W) | Stirring |
| 1     | 180          | 20:00               | 15:00       | N/A            | 1030-1800  | Off      |

* Ramp times and power may vary depending on the type and number of vessels.

Results
Samples were clear, colorless, and particle free upon dilution to 50 mL with deionized water.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
e) If using HF, follow restrictions listed in HF Addendum.
Microwave Digestion of Toray Filter in iPrep

**Procedure**

Weigh 1 filter (approximately 0.3-0.5 g) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture before closing the vessel.

**Notes**

This application can only be run in the iPrep vessel.

<table>
<thead>
<tr>
<th>Recommended Equipment</th>
<th>Recommended Vessels</th>
<th>Reagents</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARS 6 iWave</td>
<td>iPrep</td>
<td>HNO₃</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max Sample Weight</th>
<th>Sample Type</th>
<th>Control Type</th>
<th>Method Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Filter (Approx 0.3 - 0.5 g)</td>
<td>Organic</td>
<td>Ramp to Temperature</td>
<td>One Touch</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Heating Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage</td>
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<tr>
<td>1</td>
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</tbody>
</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Toray Filter (Anion)

**Procedure**
Add 1 toray filter (Approx. 0.3 - 0.5 g) into the digestion vessel. Add 10 mL HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus

**Reagents**
HNO₃

**Max Sample Weight**
1 Filter (Approx 0.3 - 0.5 g)

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
<th>Pressure (psi)</th>
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<tbody>
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</tr>
</tbody>
</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Toray Filter (Cation)

**Procedure**
Add 1 toray filter (Approx. 0.3 - 0.5 g) into the digestion vessel. Add 10 mL HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus

**Reagents**
HNO₃

**Max Sample Weight**
1 Filter (Approx 0.3 -0.5 g)

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

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<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
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<th>Pressure (psi)</th>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Materials Science
Microwave Digestion of Acrylic Tape in iPrep

**Procedure**

Weigh 0.25 g of the sample into the digestion vessel. Add 3 mL of Deionized water, 7 mL of HNO₃, 1.5 mL of HCl, and 1 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

This application can only be run in the iPrep vessel.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

**Recommended Equipment**

MARS 6 iWave

**Recommended Vessels**

iPrep

**Reagents**

HNO₃

DI H₂O

HCl

HF

**Max Sample Weight**

0.25 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.

e) If using HF, follow restrictions listed in HF Addendum.
Microwave Digestion of Bismuth Aluminate Mixture

**Procedure**

Weigh 0.1 g of the sample into the digestion vessel. Add 9 mL HCl and 3 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**

- HCl
- HNO₃

**Max Sample Weight**

0.1 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

Classic

**Heating Program**

<table>
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<tr>
<th>Stage</th>
<th>Temp (°C)</th>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Bismuth Yttrium Iron Oxide in iPrep (Step 1 of 2)

Procedure
Weigh 0.1 g of the sample into the digestion vessel. Add 6 mL of HCl, 2 mL of HNO₃, and 0.5 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel. Allow any initial reaction to subside before sealing vessel.

Notes
This application can only be run in the iPrep vessel.

HF should be added slowly and carefully to the sample.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used.

<table>
<thead>
<tr>
<th>Recommended Equipment</th>
<th>Recommended Vessels</th>
<th>Reagents</th>
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<td>MARS 6 iWave</td>
<td>iPrep</td>
<td>HCl, HNO₃, HF</td>
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<th>Method Type</th>
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* Ramp times and power may vary depending on the type and number of vessels.
Microwave Digestion of Bismuth Yttrium Iron Oxide in iPrep (Step 2 of 2)

**Procedure**

Allow vessel to cool. Add 1.75 g of solid H$_3$BO$_3$ + 20 mL deionized H$_2$O into the vessel that contains the sample and acid.

**Notes**

This procedure can be used if it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed by reaction of certain analytes with hydrofluoric acid.

**Reagents**

Solid H$_3$BO$_3$

DI H$_2$O

**Sample Type**

Standard

**Control Type**

Ramp to Temperature

**Method Type**

Classic

<table>
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<tr>
<th>Stage</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, yellow in color, and particle free upon dilution to 50 mL.

**General Precaution**

a) If using HF, follow restrictions listed in HF Addendum.

b) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

D) If programming as one touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of 
Ceramic Powder

Procedure
Weigh 0.1 g of the sample into the digestion vessel. Add 5 mL of HNO₃, 10 mL of HF, 4.4 g of Boric Acid solid, and 25 mL of H₂O. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
This procedure uses hydrofluoric acid. It is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed with boric acid.

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus

Reagents
- HNO₃
- HF
- Boric Acid (solid)
- H₂O

Max Sample Weight
0.1 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Ceramic Powder in iPrep

Procedure

Weigh 0.1 g of the sample into the digestion vessel. Add 5 mL of HNO₃, 10 mL of HF, 4.4 g of Boric Acid solid, and 25 mL of H₂O. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

This Application can only be run in the iPrep vessel.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed with boric acid.

Recommended Equipment

MARS 6 iWave

Recommended Vessels

iPrep

Reagents

HNO₃
HF
Boric Acid (solid)
H₂O

Max Sample Weight

0.1 g

Sample Type

Organic

Control Type

Ramp to Temperature

Method Type

One Touch

Heating Program

<table>
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<th>Stage</th>
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<th>*Ramp (mm:ss)</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results

Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.

e) If using HF, follow restrictions listed in HF Addendum.
Microwave Digestion of
Circuit Board (Cryo - Ground)

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 3 mL of HNO₃ and 9 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
HCl should be added slowly and carefully to the sample. Allow any initial reaction to subside before sealing vessel. This method is considered a leach and may not provide a total digestion.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HCl
HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program
<table>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, with particles upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Ferric Oxide in iPrep

Procedure
Weigh 0.1 g of the sample into the digestion vessel. Add 10 mL of a 1:1:1 HCl, HNO₃, and Deionized H₂O mixture. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
This application can only be run in the iPrep vessel.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HCl
HNO₃
DI H₂O

Max Sample Weight
0.1 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, yellow in color, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Gadolinium Zirconium Oxide in iPrep (Step 1 of 2)

Procedure
Weigh 0.1 g of the sample into the digestion vessel. Add 4 mL of $\text{H}_2\text{SO}_4$, 1.5 mL of $\text{HNO}_3$ and 1.5 mL of $\text{HF}$. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel. Allow any initial reaction to subside before sealing vessel.

Notes
This application can only be run in the iPrep vessel.

HF should be added slowly and carefully to the sample.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
$\text{H}_2\text{SO}_4$
$\text{HNO}_3$
$\text{HF}$

Max Sample Weight
0.1 g

Sample Type
Standard

Control Type
Ramp to Temperature

Method Type
Classic

Heating Program

<table>
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<tr>
<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.
Microwave Digestion of
Gadolinium Zirconium Oxide in iPrep (Step 2 of 2)

Procedure
Allow vessel to cool. Add 1.5 g of solid H₃BO₃ + 20 mL deionized H₂O into the vessel that contains the sample and acid.

Notes
This procedure can be used if it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed by reaction of certain analytes with hydrofluoric acid.

Reagents
H₃BO₃
DI H₂O

Sample Type
Standard

Control Type
Ramp to Temperature

Method Type
Classic

Heating Program

<table>
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<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) If using HF, follow restrictions listed in HF Addendum.
b) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as one touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Gas Atomized Powder in iPrep

**Procedure**
Weigh 0.1 g of the sample into the digestion vessel. Add 8 mL of HNO₃, 2 mL of HCl, and 1 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
This application can only be run in the iPrep vessel.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

<table>
<thead>
<tr>
<th>Recommended Equipment</th>
<th>Recommended Vessels</th>
<th>Reagents</th>
</tr>
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<tbody>
<tr>
<td>MARS 6 iWave</td>
<td>iPrep</td>
<td>HNO₃</td>
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<tr>
<td></td>
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<td>HCl</td>
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<th>Max Sample Weight</th>
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<th>Control Type</th>
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<tr>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Samples were clear, green in color and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.

e) If using HF, follow restrictions listed in HF Addendum.
Microwave Digestion of Glass (Ground)

Procedure
Weigh 0.1 g of the sample into the digestion vessel. Add 2 mL of HNO₃, 4 mL of HCl, and 3 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HCl
HF
HNO₃

Max Sample Weight
0.1 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Graphite Composite - Cyanate Ester Resin

Procedure
Weigh 1.5 g of the sample into the digestion vessel. Add 30 mL HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress Plus

Reagents
HNO₃

Max Sample Weight
1.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Graphite Composite - Epoxy Resin

**Procedure**

Weigh 1.0 g of the sample into the digestion vessel. Add 30 mL HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus
- MARSXpress Plus

**Reagents**

- HNO₃

**Max Sample Weight**

1.0 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of 
Graphite Composite - PEEK Resin

**Procedure**

Weigh 1.0 g of the sample into the digestion vessel. Add 30 mL of HNO3. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus
- MARSXpress Plus

**Reagents**

- HNO3

**Max Sample Weight**

1.0 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Graphite Fiber - Cyanate Siloxane Resin

### Procedure
Add 1 Laminat Square (Approx. 1 g) of the sample into the digestion vessel. Add 35 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

### Notes
Sample must be completely covered with acid prior to digestion. After digestion the samples are filtered and the fibers are rinsed with deionized water. This method is for the gravimetric (weight) determination of fiber content.

<table>
<thead>
<tr>
<th>Recommended Equipment</th>
<th>Recommended Vessels</th>
<th>Reagents</th>
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<tr>
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<th>Sample Type</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

### Results
Sample was digested, but the fiber filler material is left undigested for subsequent gravimetric analysis.

### General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Graphite Fiber - Epoxy Resin (Fiber Content)

**Procedure**
Weigh 1 g of the sample into the digestion vessel. Add 30 mL of HNO₃. Gently swirl the mixture before closing the vessel.

**Notes**
Sample must be completely covered with acid prior to digestion.

After digestion the samples are filtered and the graphite fibers are rinsed with deionized water.

This method is for the gravimetric (weight) determination of fiber content.

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<th>Recommended Equipment</th>
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<th>Control Type</th>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was digested, but the fiber filler material is left undigested for subsequent gravimetric analysis.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Pollucite Ore in iPrep (Step 1 of 2)

Procedure
Weigh 0.1 g of the sample into the digestion vessel. Add 3 mL of HNO$_3$ and 5 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

Recommended Equipment
- MARS 6 iWave

Recommended Vessels
- iPrep

Reagents
- HNO$_3$
- HF

Max Sample Weight
0.1 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.
Microwave Digestion of Pollucite Ore in iPrep (Step 2 of 2)

Procedure
Allow vessel to cool. Add 2.5 g $\text{H}_{3}\text{BO}_{3}$ and 25 mL of deionized $\text{H}_{2}\text{O}$ into the vessel that contains the sample and acid.

Notes
This procedure can be used if it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed by reaction of certain analytes with hydrofluoric acid.

Reagents
$\text{H}_{3}\text{BO}_{3}$
DI $\text{H}_{2}\text{O}$

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear and particle free upon dilution to 50 mL.

General Precaution
a) If using HF, follow restrictions listed in HF Addendum.
b) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
c) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as one touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Siloxanes

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 2 mL of HNO₃ and 5 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

**Recommended Equipment**

| MARS 6 |

**Recommended Vessels**

| EasyPrep |

**Recommended Equipment**

| MARS 6 iWave |

**Reagents**

| HNO₃ |

**HF**

**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
e) If using HF, follow restrictions listed in HF Addendum.
Metals & Alloys
Microwave Digestion of
Alpha - Alumina in iPrep

**Procedure**

Weigh 0.5 g of sample into the digestion vessel. Add 10 mL HCl. Gently swirl the vessel to thoroughly mix the sample and acid.

**Notes**

This application can only be run in the iPrep vessel.

The maximum number of vessels that can be run for this method is 6.

Ensure that particles are well suspended in acid mixture prior to sealing vessel.

Stirring may be helpful to keep particles suspended in solution during digestion.

**Recommended Equipment**

MARS 6 iWave

**Recommended Vessels**

iPrep

**Reagents**

HCl

**Max Sample Weight**

0.5 g

**Sample Type**

HCl

**Control Type**

Ramp to Temperature

**Method Type**

Classic

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Aluminum (Metal)

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HCl and 3 mL of DI H₂O. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

HCl should be added slowly and carefully to the sample. Allow any initial reaction to subside before sealing vessel.

**Recommended Equipment**

| MARS 6 |
| MARS 6 iWave |

**Recommended Vessels**

| EasyPrep |
| EasyPrep Plus |
| MARSxpress |
| MARSXpress Plus |

**Reagents**

| HCl |
| DI H₂O |

**Max Sample Weight**

| 0.5 g |

**Sample Type**

| Organic |

**Control Type**

| Ramp to Temperature |

**Method Type**

| One Touch |

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Aluminum Alloy

Procedure
Weigh 0.25 g of the sample into the digestion vessel. Add 5 mL of H₂O and 5 mL of HCl. Gently swirl the mixture before closing the vessel.

Notes
Add H₂O before HCl.
Add HCl slowly, and allow vessels to stand in the fume hood until initial reaction subsides.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HCl
H₂O

Max Sample Weight
0.25 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Aluminum Alloy (20% SiC)

**Procedure**

Weigh 0.2 g of the sample into the digestion vessel. Add 5 mL of HCl and 5 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides.

**Notes**

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes.

**Recommended Equipment**

MARS 6
MARS 6 iWave

**Recommended Vessels**

EasyPrep
EasyPrep Plus

**Reagents**

HCl
HF

**Max Sample Weight**

0.2 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

<table>
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<th>Stage</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Aluminum Alloy (BCS 182)

Procedure
Weigh 0.2 g of the sample into the digestion vessel. Add 20 mL of HCl, 10 mL of H₂O₂ (30%), and 5 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides.

Notes
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HCl
H₂O₂ (30%)
HF

Max Sample Weight
0.2 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
**Microwave Digestion of Aluminum Oxide**

**Procedure**
Weigh 0.25 g of sample into the digestion vessel. Add 6.5 mL H₃PO₄ and 3.5 mL H₂SO₄. Gently swirl the vessel to thoroughly mix the sample and acid.

**Notes**
EasyPrep Plus requires a high temperature probe for this method.

Ensure that particles are well suspended in acid mixture prior to sealing vessel.

Stirring may be helpful to keep particles suspended in solution during digestion.

<table>
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<tr>
<th>Recommended Equipment</th>
<th>Recommended Vessels</th>
<th>Reagents</th>
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<td>EasyPrep</td>
<td>H₃PO₄</td>
</tr>
<tr>
<td>MARS 6 iWave</td>
<td>EasyPrep Plus</td>
<td>H₂SO₄</td>
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**Heating Program**

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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Aluminum Oxide (H₃PO₄) in iPrep

**Procedure**

Weigh 0.1 g of the sample into the digestion vessel. Add 8 mL H₃PO₄. Gently swirl the mixture and wait approximately 15 minutes to predigest before closing the vessel.

**Notes**

This application can only be run in the iPrep vessel.

This method may not provide a total digest of all samples. Hydrofluoric acid may be required to provide complete digestion of some sample matrixes.

<table>
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<tr>
<th>Recommended Equipment</th>
<th>Recommended Vessels</th>
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<td>MARS 6 iWave</td>
<td>iPrep</td>
<td>H₃PO₄</td>
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<p>| Heating Program |
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear and colorless with some white particles remaining upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of 
Boron

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 5 mL of HNO₃ and 5 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides.

**Notes**

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

**Recommended Equipment**

MARS 6
MARS 6 iWave

**Recommended Vessels**

EasyPrep
EasyPrep Plus

**Reagents**

HNO₃
HF

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<th>Sample Type</th>
<th>Control Type</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Boron Carbide ($B_4C$) in iPrep

**Procedure**
Weigh 0.2 g of the sample into the digestion vessel. Add 5 mL of HNO$_3$ and 5 mL of H$_2$SO$_4$. Gently swirl to mix the sample particles in the acid. Slowly and carefully add 5 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Allow any initial reaction to subside before sealing vessel.

**Notes**
This application can only be run in the iPrep vessel.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used. This procedure can be found in the One Touch Method note entitled "BoricAcid HF Neutralization".

Reducing the particle size increases the efficiency of digestion and may decrease the digestion time.

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<th>Recommended Equipment</th>
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<th>Reagents</th>
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<td>iPrep</td>
<td>HNO$_3$</td>
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<tr>
<td></td>
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<td>H$_2$SO$_4$</td>
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**Max Sample Weight**
0.2 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

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</table>

*Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Carbonyl Iron in iPrep

**Procedure**

Weigh 0.2 g of the sample into the digestion vessel. Add 6 mL HNO₃, 2 mL HCl, and 1 mL HBF₄ slowly. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

This application can only be run in the iPrep vessel.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes.

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**Heating Program**

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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, yellow in color with no visible particles upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Cobalt - Chromium Alloy (Co-Cr) (Step 1 of 2)

Procedure
Add 0.5 g of the sample into the digestion vessel. Add 5 mL of HNO₃, 5 mL of HF, and 5 mL of deionized H₂O. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HNO₃
HF
DI H₂O

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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* Ramp times and power may vary depending on the type and number of vessels.
Microwave Digestion of Cobalt - Chromium Alloy (Co-Cr) (Step 2 of 2)

**Procedure**
Allow vessels to cool. Open and add 4 mL of H$_2$O$_2$ (30%) dropwise. Wait approximately 15 minutes before closing the vessel.

**Notes**

**Reagents**
H$_2$O$_2$ (30%)

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as one touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Copper (Metal)

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**
- HNO₃

**Max Sample Weight**
- 0.5 g

**Sample Type**
- Organic

**Control Type**
- Ramp to Temperature

**Method Type**
- One Touch

**Heating Program**

<table>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Copper Ore

Procedure
Weigh 0.5 g (0.25 g w/Xpress Vessels) of the sample into the digestion vessel. Add 10 mL of Aqua Regia (3:1 HCl:HNO₃). Gently swirl the mixture before closing the vessel.

Notes
This method is intended to be an acid leach, not a total digest. Hydrofluoric acid will be required to provide complete digestion of the sample matrix.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Recommended Equipment
Reagents
HNO₃, HCl

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, and colorless with some remaining particles upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of 

**Gallium**

**Procedure**

Weigh 0.3 g of the sample into the digestion vessel. Add 2 mL of HNO₃ and 8 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides.

**Notes**

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus

**Reagents**

- HNO₃
- HF

<table>
<thead>
<tr>
<th>Max Sample Weight</th>
<th>Sample Type</th>
<th>Control Type</th>
<th>Method Type</th>
</tr>
</thead>
<tbody>
<tr>
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<td>One Touch</td>
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<td>900-1800</td>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Iron - Chromium Alloy (Step 1 of 2)

**Procedure**

Add 0.5 g of the sample into the digestion vessel. Add 5 mL of HCl, 5 mL of HF, and 2 mL of deionized H₂O. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides.

**Notes**

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus

**Reagents**

- HCl
- HF
- DI H₂O

**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.
Microwave Digestion of Iron - Chromium Alloy (Step 2 of 2)

**Procedure**
Allow vessels to cool. Open and add 5 mL of HNO₃. Wait approximately 15 minutes before closing the vessel.

**Notes**

**Reagents**
HNO₃

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

<table>
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<tr>
<th>Heating Program</th>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as one touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Iron - Chromium Alloy in iPrep

Procedure
Weigh 0.25 g of the sample into the digestion vessel. Add 5 mL of HCl, 5 mL of HF, and 5 mL HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides.

Notes
This application can only be run in the iPrep vessel.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HCl  
HF  
HNO₃

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HCl  
HF  
HNO₃

Max Sample Weight
0.25 g  
Sample Type
Organic  
Control Type
Ramp to Temperature  
Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
e) If using HF, follow restrictions listed in HF Addendum.
Microwave Digestion of Iron - Lignosulfonate

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Reagents
HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Iron - Manganese Alloy

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HCl and 2 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides.

Notes
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HCl
HF

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HF, 5 mL HCl, and 3 mL HNO₃. Gently swirl the mixture and allow any initial reaction to subside before sealing vessel.

HF should be added slowly and carefully to the sample.

**Notes**

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes.

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**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

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*Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Lead Sulfide (PbS)

**Procedure**

Weigh 0.1 g of the sample into the digestion vessel. Add 5 mL of HNO$_3$ and 5 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4 ml) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

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<tr>
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<td>MARS 6 iWave</td>
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**Recommended Vessels**

| EasyPrep |
| EasyPrep Plus |

**Reagents**

| HNO$_3$ |
| HCl |

**Max Sample Weight**

| 0.1 g |

**Sample Type**

| Organic |

**Control Type**

| Ramp to Temperature |

**Method Type**

| One Touch |

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Lithium Nickel Cobalt Manganese Oxide

Procedure
Weigh 0.1 g of the sample into the digestion vessel. Add 4 mL of HNO₃ and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 ml) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- MARSXpress

Reagents
- HNO₃
- HCl

Max Sample Weight
0.1 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
The samples were clear, green in color, and particle free upon dilution.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of 
**Magnesium Oxide (MgO 40-54%)**

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 5 mL of DI H₂O, 5 mL HCl, and 5 mL HNO₃. Gently swirl and allow approximately 15 minutes for pre-digestion.

**Notes**
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**
- H₂O (deionized)
- HCl
- HNO₃

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of 
Manganous Oxide (MnO) (Step 1 of 2)

### Procedure

Weigh 0.2g of the sample into the digestion vessel. Add 10 mL HNO₃ and 3 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

HF should be added slowly and carefully to the sample. Allow any initial reaction to subside before sealing vessel.

### Notes

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

### Recommended Equipment

- MARS 6
- MARS 6 iWave

### Recommended Vessels

- EasyPrep
- EasyPrep Plus

### Reagents

- HNO₃
- HF

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### Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.
Microwave Digestion of Manganous Oxide (MnO) (Step 2 of 2)

Procedure
Allow vessel to cool after completion of Step 1. Open and add 5 mL of HCl. Gently swirl the mixture and seal the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Reagents
HCl

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as one touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Metal Alloy - FeCr

**Procedure**

Weigh 0.25 g of the sample into the digestion vessel. Add 5 mL of HCl, 5 mL of HNO₃, and 5 mL of HF. Gently swirl the mixture before closing the vessel.

**Notes**

The above procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric HF Neutralization”

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus

**Reagents**

- HCl
- HF
- HNO₃

**Max Sample Weight**

0.25 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Metal Alloy - NiCr

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 5 mL of H₂O, 5 mL of HNO₃, and 5 mL of HF. Gently swirl the mixture before closing the vessel.

**Notes**
The above procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric HF Neutralization”

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Metal Alloy (Ag, Au, Cu) in iPrep

**Procedure**

Weigh 0.1 g of the sample into the digestion vessel. Add 9 mL HCl, 1 mL HNO₃. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

**Notes**

This application can only be run in the iPrep vessel.

This method may not provide a total digest of all samples. Hydrofluoric acid may be required to provide complete digestion of some sample matrices.

**Recommended Equipment**

MARS 6 iWave

**Recommended Vessels**

iPrep

**Reagents**

HCl

HNO₃

**Max Sample Weight**

0.1 g

**Sample Type**

HCl

**Control Type**

Ramp to Temperature

**Method Type**

Classic

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was yellow in color, with some white particles remaining upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Metal Alloy (Ag, Co, Cu) in iPrep

**Procedure**
Weigh 0.1 g of the sample into the digestion vessel. Add 3 mL HNO₃, 3 mL Deionized H₂O and 3 mL HF (in this order). Add HF slowly and carefully. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

**Notes**
This application can only be run in the iPrep vessel.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

**Recommended Equipment**
MARS 6 iWave

**Recommended Vessels**
iPrep

**Reagents**
HNO₃, Deionized H₂O, HF

**Max Sample Weight**
0.1 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
e) If using HF, follow restrictions listed in HF Addendum.
Microwave Digestion of Metal Alloy (Ag, Cu, Sn) in iPrep

Procedure
Weigh 0.1 g of the sample into the digestion vessel. Add 3 mL HNO₃, 3 mL Deionized Water, and 3 mL HF in this order. Add HF slowly and carefully. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

Notes
This application can only be run in the iPrep vessel.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HNO₃
DI H₂O
HF

Max Sample Weight
0.1 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<tr>
<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
e) If using HF, follow restrictions listed in HF Addendum.
Microwave Digestion of Metal Ore - Precious (Step 1 of 2)

Procedure
Weigh 0.1 g of the sample into the digestion vessel. Add 10 mL of HNO₃, and 0.5 ml of HF. Gently swirl the mixture before closing the vessel.

Notes
The above procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric HF Neutralization”

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus

Reagents
- HNO₃
- HF

Max Sample Weight
- 0.1 g

Sample Type
- Organic

Control Type
- Ramp to Temperature

Method Type
- One Touch

Heating Program
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* Ramp times and power may vary depending on the type and number of vessels.
Microwave Digestion of Metal Ore - Precious (Step 2 of 2)

Procedure
Cool, vent and open vessel after step 1. Add 5 ml of HCl.

Notes
The addition of Conc. HCl (0-4mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Reagents
HCl

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as one touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Metals Alloy (Co-Cr) (Step 1 of 2)

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 5 ml of HNO₃, 5 ml of HF, and 5 of ml H₂O. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The addition of Deionized Water may improve solubility of metal alloys.
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

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<th>Recommended Equipment</th>
<th>Recommended Vessels</th>
<th>Reagents</th>
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<td>MARS 6</td>
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<td>MARS 6 iWave</td>
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* Ramp times and power may vary depending on the type and number of vessels.
Microwave Digestion of Metals Alloy (Co-Cr) (Step 2 of 2)

Procedure
Cool, vent and open vessel after step 1. Add 4 ml of H₂O₂ (30%)

Notes

Reagents
H₂O₂

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
Microwave Digestion of Nickel (II) Hydroxide

**Procedure**

Weigh 0.1 g of the sample into the digestion vessel. Add 4 mL of HNO₃ and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4 ml) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- MARSXpress

**Reagents**

- HNO₃
- HCl

**Max Sample Weight**

0.1 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

The samples were clear, light green in color, and particle free upon dilution.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Nickel (Metal)

**Procedure**
Weigh 0.5 g of sample into the digestion vessel. Add 5 mL of HNO₃ and 5 mL of DI H₂O. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

**Reagents**
- HNO₃
- DI H₂O

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Niobium - Titanium Alloy

**Procedure**

Weigh 0.2 g of the sample into the digestion vessel. Add 1 mL of HF, 5 mL HNO₃, and 5 mL of deionized H₂O. Gently swirl the mixture and wait approximately 15 minutes before sealing vessel.

**Notes**

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

The addition of Conc. HCl (0-4 ml) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes.

**Recommended Equipment**

| MARS 6 |
| EasyPrep |
| EasyPrep Plus |

**Recommended Vessels**

| MARS 6 iWave |
| EasyPrep |
| EasyPrep Plus |

**Reagents**

| HF |
| HNO₃ |
| DI H₂O |

**Max Sample Weight**

0.2 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Phosphate (21%)

Procedure
Weigh 0.25 g of the sample into the digestion vessel. Add 5 mL of H₂O₂ (30%), 5 mL HCl dropwise (wait for reaction to subside before adding next acid), and 5 mL HNO₃. Gently swirl the mixture and wait approximately 1 hour before closing the vessel.

Notes

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

Reagents
- H₂O₂ (30%)
- HCl
- HNO₃

Max Sample Weight
- 0.25 g

Sample Type
- Organic

Control Type
- Ramp to Temperature

Method Type
- One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of 
Platinum Metal

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of Aqua Regia (3:1 HCl:HNO₃). Gently swirl the mixture before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**
- HNO₃
- HCl

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Platinum Ruthenium in iPrep

**Procedure**
Weigh 0.1 g of the sample into the digestion vessel. Add 6 mL of HCl, and 2 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
This application can only be run in the iPrep vessel.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**
MARS 6 iWave

**Recommended Vessels**
iPrep

**Reagents**
HCl, HNO₃

**Max Sample Weight**
0.1 g

**Sample Type**
HCl

**Control Type**
Ramp to Temperature

**Method Type**
Classic

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of 
**Rhodium Sponge in iPrep**

### Procedure

Weigh 0.1 g of the sample into the digestion vessel. Add 10 mL of HCl and 2 mL of H₂O₂ dropwise. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

### Notes

This application can only be run in the iPrep vessel.

The maximum number of vessels that can be run with this method is 6.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes.

### Recommended Equipment

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<thead>
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### Recommended Vessels

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### Reagents

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### Max Sample Weight

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### Sample Type

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### Control Type

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### Method Type

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<th>* Power (W)</th>
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</table>

*Ramp times and power may vary depending on the type and number of vessels.

### Results

Sample was clear and colorless upon dilution to 50 mL.

### General Precaution

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Selenium Alloy

**Procedure**
Weigh 1 g (0.5 g w/Xpress Vessels) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**
- HNO₃

**Max Sample Weight**
1.0 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

<table>
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<tr>
<th>Stage</th>
<th>Temp (°C)</th>
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<th>Hold (mm:ss)</th>
<th>Pressure (psi)</th>
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</tbody>
</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Sn - Ag Solder

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Slowly add dropwise 10 ml of 1:1:1 H₂O:HNO₃:HF (premixed) to the sample. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
Caution must be taken when adding the acid solution to the sample as the reaction is very vigorous and exothermic.
Allow any initial reaction to subside before sealing the vessel.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Reagents
H₂O
HNO₃
HF

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Stainless and Low Carbon Steel in iPrep

**Procedure**
Add 0.25 g of the sample into the digestion vessel. Add 3 mL of HNO₃, and 9 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
This application can only be run in the iPrep vessel.

<table>
<thead>
<tr>
<th>Recommended Equipment</th>
<th>Recommended Vessels</th>
<th>Reagents</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARS 6 iWave</td>
<td>iPrep</td>
<td>HNO₃, HCl</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max Sample Weight</th>
<th>Sample Type</th>
<th>Control Type</th>
<th>Method Type</th>
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<tbody>
<tr>
<td>0.25 g</td>
<td>HCl</td>
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<table>
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<tr>
<th>Heating Program</th>
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<tbody>
<tr>
<td>Stage</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>1</td>
</tr>
</tbody>
</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, gold colored, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Stainless Steel

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 9 ml of HCl, 3 mL of HNO₃, and 3 mL of HF. Gently swirl the mixture before closing the vessel.

**Notes**
The above procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric HF Neutralization”

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus

**Reagents**
HNO₃
HF
HCl

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
<th>Pressure (psi)</th>
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</tbody>
</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Steel (Stainless)

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 3 mL of HNO₃ and 9 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

This method may not provide a total digest of all samples. Hydrofluoric acid will be required to provide complete digestion of some sample matrixes.

**Recommended Equipment**

<table>
<thead>
<tr>
<th>MARS 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARS 6 iWave</td>
</tr>
</tbody>
</table>

**Recommended Vessels**

| EasyPrep |
| EasyPrep Plus |
| MARSxpress |
| MARSxpress Plus |

**Reagents**

| HCl |
| HNO₃ |

**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
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<td>800</td>
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</tbody>
</table>

*Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Strontium Ferrite in iPrep

**Procedure**

Weigh 0.5 g of sample into the digestion vessel. Add 10 mL of HCl and 0.5 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

This application can only be run in the iPrep vessel.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution.

<table>
<thead>
<tr>
<th>Recommended Equipment</th>
<th>Recommended Vessels</th>
<th>Reagents</th>
</tr>
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<tr>
<td>MARS 6 iWave</td>
<td>iPrep</td>
<td>HCl</td>
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<td></td>
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<table>
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<th>Max Sample Weight</th>
<th>Sample Type</th>
<th>Control Type</th>
<th>Method Type</th>
</tr>
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<tbody>
<tr>
<td>0.5 g</td>
<td>HCl</td>
<td>Ramp to Temperature</td>
<td>Classic</td>
</tr>
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</table>

| Heating Program |
|-----------------|-------------|-------------|-------------|
| Stage | Temp (°C) | *Ramp (mm:ss) | Hold (mm:ss) | Pressure (psi) | * Power (W) | Stirring |
| 1     | 200        | 30:00       | 15:00       | N/A            | 900-1800    | Off      |

* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
e) If using HF, follow restrictions listed in HF Addendum.
Microwave Digestion of Titanium Alloy

**Procedure**

Weigh 0.2 g of the sample into the digestion vessel. Add 5 mL of HNO₃, 2 mL of HCl, and 5 mL of HF. Gently swirl the mixture before closing the vessel.

**Notes**

The above procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric HF Neutralization”

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus

**Reagents**

- HNO₃
- HF
- HCl

**Max Sample Weight**

0.2 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
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<td>900-1800</td>
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</tbody>
</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Titanium Dioxide

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃ and 2 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HNO₃
HF

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
<th>Pressure (psi)</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Tungsten Ore (50% W; 10% Fe; 2% Mn)

Procedure
Weigh 0.2 g of the sample into the digestion vessel. Add 9 mL of HCl and 1 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

HF should be added slowly and carefully to the sample. Allow any initial reaction to subside before sealing vessel.

Notes
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

The addition of Conc. HCl (0-4 ml) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus

Reagents
- HCl
- HF

Max Sample Weight
0.2 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
<th>Pressure (psi)</th>
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<td>900-1800</td>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Zinc Oxide (ZnO)

Procedure
Weigh 0.1 g of the sample into the digestion vessel. Add 5 mL of HNO₃ and 2 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel. HF should be added slowly and carefully to the sample. Allow any initial reaction to subside before sealing vessel.

Notes
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HNO₃
HF

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.

<table>
<thead>
<tr>
<th>Max Sample Weight</th>
<th>Sample Type</th>
<th>Control Type</th>
<th>Method Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1 g</td>
<td>Organic</td>
<td>Ramp to Temperature</td>
<td>One Touch</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
<th>Pressure (psi)</th>
<th>* Power (W)</th>
<th>Stirring</th>
</tr>
</thead>
<tbody>
<tr>
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<td>15:00</td>
<td>800</td>
<td>900-1800</td>
<td>Off</td>
</tr>
</tbody>
</table>

* Ramp times and power may vary depending on the type and number of vessels.
Microwave Digestion of Zinc Oxide (ZnO) in iPrep

Procedure
Weigh 0.25 g of the sample (onto a filter disk) into the digestion vessel. Add 5 mL HNO₃ and 2 mL HF. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

Notes
This application can only be run in the iPrep vessel.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HNO₃
HF

Max Sample Weight
0.25 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
<th>Pressure (psi)</th>
<th>* Power (W)</th>
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</thead>
<tbody>
<tr>
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<td>25:00</td>
<td>15:00</td>
<td>N/A</td>
<td>700-1800</td>
<td>Off</td>
</tr>
</tbody>
</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
e) If using HF, follow restrictions listed in HF Addendum.
Microwave Digestion of
Zircon Alloy

**Procedure**
Add 1.0 g of the sample into the digestion vessel. Add 5 mL of HF, 1 mL HNO₃, and 10 mL of deionized H₂O. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides.

**Notes**
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus

**Reagents**
HF
HNO₃
DI H₂O

**Max Sample Weight**
1.0 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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*Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Nutraceuticals
Microwave Digestion of Biotin

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃, and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

**Reagents**
HNO₃
HCl

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Cannabis (Plant)

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃, or alternatively 9 mL HNO₃, and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpess
MARSxpess Plus

Reagents
HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Chili Powder in iPrep

Procedure
Weigh 2 g of the sample into the digestion vessel. Add 10 mL HNO₃ and 5 mL deionized H₂O. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
This application can only be run in the iPrep vessel.
The use of HF may be required to digest any silicates found in the sample.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HNO₃
DI H₂O

Table: Heating Program

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<tr>
<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear and colorless with some small particles (silicates) remaining upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Citrus Leaves

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 6 mL of HNO₃, 3 mL of deionized H₂O, and 1 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides.

Notes
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HNO₃
DI H₂O
HF

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of 
Ginkgo (Ground)

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of $\text{HNO}_3$. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

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**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Ginkgo (Whole Pill)

**Procedure**

Weigh 1 pill (approx 1.0 g) into the digestion vessel. Add 10 mL of HNO₃ and 2 mL of H₂O₂. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**

- HNO₃
- H₂O₂

**Max Sample Weight**

1 Pill (Approx 1.0 g)

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Infant Formula (Liquid) in iPrep

**Procedure**
Transfer 2 mL of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

**Notes**
This application can only be run in the iPrep vessel.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**
MARS 6 iWave

**Recommended Vessels**
iPrep

**Reagents**
HNO₃

**Max Sample Weight**
2 mL

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Infant Formula (Liquid)

**Procedure**
Transfer 1 mL (0.5 mL w/Xpress Vessels) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

**Reagents**
HNO₃

**Max Sample Weight**
1 mL

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Infant Formula (Powder) in iPrep

Procedure
Weigh 1 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

Notes
This application can only be run in the iPrep vessel.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HNO₃

Max Sample Weight
1.0 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Infant Formula (Powder)

Procedure
Weigh 0.5 g (0.25 g w/Xpress Vessels) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Reagents
HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Kelp

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃ and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃
HCl

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Milk (Whole - Liquid)

Procedure
Transfer 4 mL of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃

Max Sample Weight
4 mL

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
**Microwave Digestion of Milk (Powder)**

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

**Reagents**
- HNO₃

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<th>Method Type</th>
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**Heating Program**

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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
**Plant Tissue**

### Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

### Notes
The addition of Conc. HCl (0-4mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Some plant tissues contain silicates which would require HF for total dissolution.

### Recommended Equipment
- MARS 6
- MARS 6 iWave

### Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

### Reagents
- HNO₃

### Max Sample Weight
- 0.5 g

### Sample Type
- Organic

### Control Type
- Ramp to Temperature

### Method Type
- One Touch

### Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

### Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

### General Precaution

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
**Microwave Digestion of USP 232/233 (Pharmaceuticals)**

**Procedure**

Weigh 0.2 g of the sample into the digestion vessel. Add 9 mL of HNO$_3$, and 1 mL HCl. Gently swirl the mixture before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

MARS 6
MARS 6 iWave

**Recommended Vessels**

EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

**Reagents**

HNO$_3$
HCl

**Max Sample Weight**

0.2 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Wheat

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The use of HF may be required to digest any silicates found in the sample.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Reagents
HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Whey (Powder)

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Concentrated HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

Reagents
- HNO₃

Max Sample Weight
- 0.5 g

Sample Type
- Organic

Control Type
- Ramp to Temperature

Method Type
- One Touch

Heating Program

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Organic Chemicals
Microwave Digestion of Di-(2-ethylhexyl)phosphoric Acid in iPrep

**Procedure**
Transfer 0.5 mL of the sample into the digestion vessel. Add 10 mL HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
This application can only be run in the iPrep vessel.

**Recommended Equipment**
MARS 6 iWave

**Recommended Vessels**
iPrep

**Reagents**
HNO₃

**Max Sample Weight**
0.5 mL

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Diazo Sulfonyl Chloride

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

<table>
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<th>MARS 6</th>
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<tbody>
<tr>
<td>MARS 6 iWave</td>
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**Recommended Vessels**

| EasyPrep |
| EasyPrep Plus |
| MARSxpress |
| MARSxpress Plus |

**Reagents**

HNO₃

**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

<table>
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*Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of 
Food Coloring (Erythrosine Based)

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

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**Recommended Vessels**

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<tr>
<th>EasyPrep</th>
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<tbody>
<tr>
<td>EasyPrep Plus</td>
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**Reagents**

| HNO₃ |

**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Methylcellulose (Hydroxypropyl)

Procedure
Weigh 0.1 g of the sample into the digestion vessel. Add 10 mL of HNO₃ and 2 mL of deionized H₂O. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Reagents
HNO₃
DI H₂O

Max Sample Weight
0.1 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Monoethanolamine

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 5 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**
- HNO₃

| Max Sample Weight | 0.5 g |
| Sample Type       | Organic |
| Control Type      | Ramp to Temperature |
| Method Type       | One Touch |

**Heating Program**

<table>
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<tr>
<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Photoresist

**Procedure**
Add 0.25 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus

**Reagents**
- HNO₃

**Max Sample Weight**
- 0.25 g

**Sample Type**
- Organic

**Control Type**
- Ramp to Temperature

**Method Type**
- One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Polygluteramide

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus

**Reagents**

- HNO₃

**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Paints & Coatings
Microwave Digestion of Paint (Latex Based Liquid)

**Procedure**

Weigh 1 g (0.5 g w/Xpress Vessels) of sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture before closing the vessel.

**Notes**

HF is required for a total dissolution of inorganic filler if present.

If this procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

**Recommended Equipment**

<table>
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<th>MARS 6</th>
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</thead>
<tbody>
<tr>
<td>MARS 6 iWave</td>
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**Recommended Vessels**

| EasyPrep  |
| EasyPrep Plus |
| MARSxpress  |
| MARSxpress Plus |

**Reagents**

HNO₃

**Max Sample Weight**

0.25 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Paint Chips (For Pb Analysis)

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture before closing the vessel.

Notes
HF may be required for a total dissolution.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Reagents
HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, with some remaining inorganic particles upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Photoresist

Procedure
Add 0.25 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HNO₃

Max Sample Weight
0.25 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Polyurethane

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

### Notes

**Recommended Equipment**

| MARS 6 |
| MARS 6 iWave |

**Recommended Vessels**

| EasyPrep |
| EasyPrep Plus |

**Reagents**

| HNO₃ |

**Max Sample Weight**

| 0.5 g |

**Sample Type**

| Organic |

**Control Type**

| Ramp to Temperature |

**Method Type**

| One Touch |

### Heating Program

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*Ramp times and power may vary depending on the type and number of vessels.

### Results

Sample was clear, colorless, and particle free upon dilution to 50 mL.

### General Precaution

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Polyurethane in iPrep

Procedure
Weigh 0.2 g of the sample into the digestion vessel. Add 6 mL HNO₃, and 3 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

Notes
This application can only be run in the iPrep vessel.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HNO₃
HCl

Max Sample Weight
0.2 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Toner (Ink) in iPrep

Procedure
Weigh 0.3 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
This application can only be run in the iPrep vessel.

The use of HF may be required to digest any silicates found in the sample.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HNO₃

Max Sample Weight
0.3 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless with some particles remaining upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Toner (Powder) in iPrep

Procedure
Weigh 0.3 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

Notes
This application can only be run in the iPrep vessel.
The use of HF may be required to digest any silicates found in the sample.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HNO₃

Max Sample Weight
0.3 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
e) If using HF, follow restrictions listed in HF Addendum.
Paper & Pulp
Microwave Digestion of
Filter Paper - 37 mm Mixed Cellulose Ester

Procedure
Weigh 1 filter (approx 0.3 g) into the digestion vessel. Add 10 mL HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃

Max Sample Weight
1 Filter (Approx 0.3 g)

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program
<table>
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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Filter Paper - 47 mm Polycarbonate

Procedure
Weigh 1 filter (approx 0.4 g) into the digestion vessel. Add 10 mL HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃

Max Sample Weight
1 Filter (Approx 0.4 g)

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Filter Paper - Cellulose

**Procedure**

Weigh 1 filter (approx 0.9 g) of the sample into the digestion vessel. Add 5 mL of H₂O, and 5 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

Add H₂O before HNO₃.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**

- H₂O
- HNO₃

**Max Sample Weight**

1 Filter (Approx 0.9 g)

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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*Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Paper Pulp

Procedure
Weigh 0.5 g (dry weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃

Max Sample Weight
0.5 g (Dry Weight)

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Personal Care
Microwave Digestion of Boric Acid HF Neutralization

**Procedure**

Allow vessel to cool. Add 30 mL H₃BO₃ (4%) into the vessel that contains the sample and acid.

**Notes**

This procedure can be used if it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed by reaction of certain analytes with hydrofluoric acid.

Alternatively, 1-4 g of solid H₃BO₃ + 25 mL deionized H₂O can be used in place of the 4% w/v solution.

**Recommended Equipment**

MARS 6
MARS 6 iWave

**Recommended Vessels**

EasyPrep
EasyPrep Plus
MARSXpress Plus

**Reagents**

H₃BO₃ (4%)

**Max Sample Weight**

Varies by Sample

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

See sample specific method notes.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Cosmetics (Liquid Make-Up)

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 8 mL of HNO₃ and 2 mL of HF. Gently swirl the mixture before closing the vessel.

Notes
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus

Reagents
- HNO₃
- HF

Max Sample Weight
- 0.5 g

Sample Type
- Organic

Control Type
- Ramp to Temperature

Method Type
- One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Eye Shadow

Procedure
Weigh 0.25 g of the sample into the digestion vessel. Add 7 mL of HNO₃ and 3 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HNO₃
HF

Max Sample Weight
0.25 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Shampoo (Dandruff)

**Procedure**
Transfer 1 mL of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The use of HF may be required to digest any silicates found in the sample.

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**
- HNO₃

**Max Sample Weight**
1 mL

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Pharmaceutical & Biotech
Microwave Digestion of Allergy Pill (Ground)

Procedure
Weigh 0.25 g of the sample into the digestion vessel. Add 9 mL of HNO₃ and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

Reagents
- HNO₃
- HCl

Max Sample Weight
0.25 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Allergy Pill (Whole Pill)

Procedure
Weigh 1 pill (Approx 1.0 g) into the digestion vessel. Add 10 mL of HNO$_3$ and 2 mL of H$_2$O$_2$ (30%). Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Max Sample Weight
1 Pill (Approx 1.0 g)

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Reagents
HNO$_3$
H$_2$O$_2$ (30%)

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Antioxidant (Ground)

Procedure

Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃ and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment

MARS 6
MARS 6 iWave

Recommended Vessels

EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Recommended Reagents

HNO₃
HCl

Max Sample Weight

0.5 g

Sample Type

Organic

Control Type

Ramp to Temperature

Method Type

One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results

Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Antioxidant (Whole Pill)

Procedure
Weigh 1 pill (approx 1.4 g) into the digestion vessel. Add 10 mL of HNO₃ and 2 mL of H₂O₂ (30%). Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

Reagents
- HNO₃
- H₂O₂ (30%)

Max Sample Weight
- 1 Pill (Approx 1.4 g)

Sample Type
- Organic

Control Type
- Ramp to Temperature

Method Type
- One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of APIs with Aromatic Ring Structures in iPrep

Procedure
Weigh 0.1 g of the sample into the digestion vessel. Add 9 mL of HNO$_3$ and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

Notes
This application can only be run in the iPrep vessel.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HNO$_3$
HCl

Max Sample Weight
0.1 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL. If the sample contains precious metals the diluted sample may be the color associated with the metals.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Ascorbic Acid

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃, and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃
HCl

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Aspirin (Ground)

Procedure
Weigh 0.25 g of the sample into the digestion vessel. Add 9 mL of HNO₃ and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Reagents
HNO₃
HCl

Max Sample Weight
0.25 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Aspirin (Whole)

Procedure
Weigh 1 pill (Approx 1.0 g) into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

Reagents
- HNO₃

Max Sample Weight
1 pill (Approx 1.0 g)

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Beta Carotene

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃, and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSXpress Plus

**Reagents**
- HNO₃
- HCl

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

- a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
- b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
- c) The control / reference vessel must contain the largest and most reactive sample.
- d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
- e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Biotin

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃, and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Reagents
HNO₃
HCl

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Calcium Carbonate

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Slowly add 9 mL of HNO₃ and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Allow initial reaction to subside before sealing vessel.

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

**Reagents**

- HNO₃
- HCl

**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of 
**Calpan Pantothenic Acid**

### Procedure

Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃ and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

### Notes

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

### Recommended Equipment

- MARS 6
- MARS 6 iWave

### Recommended Vessels

- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

### Reagents

- HNO₃
- HCl

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<th>Max Sample Weight</th>
<th>Sample Type</th>
<th>Control Type</th>
<th>Method Type</th>
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### Heating Program

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</table>

* Ramp times and power may vary depending on the type and number of vessels.

### Results

Sample was clear, colorless, and particle free upon dilution to 50 mL.

### General Precaution

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Cephalexin

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Chromium Chelate

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃ and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

**Reagents**
HNO₃
HCl

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
The sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Cold & Flu Medicine (Liquid)

**Procedure**
Transfer 0.75 mL of the sample into the digestion vessel. Add 9 mL of HNO₃ and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

**Reagents**
HNO₃
HCl

**Max Sample Weight**
0.75 mL

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Cupric Sulfate

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃, and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

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<th>Max Sample Weight</th>
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<tbody>
<tr>
<td>0.5 g</td>
<td>Organic</td>
<td>Ramp to Temperature</td>
<td>One Touch</td>
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**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

**Reagents**
HNO₃
HCl

**Heating Program**

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*Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, blue in color, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of

**Diclofenac K**

### Procedure

Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃ and 2 mL of H₂O₂ (30%). Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

### Notes

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

### Recommended Equipment

- MARS 6
- MARS 6 iWave

### Recommended Vessels

- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

### Reagents

- HNO₃
- H₂O₂ (30%)

### Max Sample Weight

**0.5 g**

### Sample Type

**Organic**

### Control Type

**Ramp to Temperature**

### Method Type

**One Touch**

### Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

### Results

Sample was clear, colorless, and particle free upon dilution to 50 mL.

### General Precaution

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Empty Capsule (Gel)

**Procedure**

Weigh 1 capsule (Approx 0.1 g) into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

MARS 6
MARS 6 iWave

**Recommended Vessels**

EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

**Reagents**

HNO₃

**Max Sample Weight**

1 Capsule (Approx 0.1 g)

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of 
**Erythromycin**

### Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃ and 1 mL HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

### Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

### Recommended Equipment
| MARS 6 | MARS 6 iWave |

### Recommended Vessels
| EasyPrep | EasyPrep Plus | MARSXpress | MARSXpress Plus |

### Reagents
| HNO₃ | HCl |

### Max Sample Weight
0.5 g

### Sample Type
Organic

### Control Type
Ramp to Temperature

### Method Type
One Touch

### Heating Program
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* Ramp times and power may vary depending on the type and number of vessels.

### Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

### General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Fish Oil (No Capsule)

**Procedure**

Weigh 0.25 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

<table>
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<tr>
<th>MARS 6</th>
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<tbody>
<tr>
<td>MARS 6 iWave</td>
</tr>
</tbody>
</table>

**Recommended Vessels**

| EasyPrep |
| EasyPrep Plus |
| MARSXpress |
| MARSXpress Plus |

**Reagents**

| HNO₃ |

**Max Sample Weight**

0.25 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Flurbiprofen

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃ and 1 mL HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃
HCl

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control/ reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Folic Acid

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃ and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

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<th>Recommended Vessels</th>
<th>Reagents</th>
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<td>HNO₃</td>
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<tr>
<td>MARS 6 iWave</td>
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<td>HCl</td>
</tr>
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<tr>
<td></td>
<td>MARSXpress Plus</td>
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<th>Sample Type</th>
<th>Control Type</th>
<th>Method Type</th>
</tr>
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<tbody>
<tr>
<td>0.5 g</td>
<td>Organic</td>
<td>Ramp to Temperature</td>
<td>One Touch</td>
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<td>Stage</td>
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*Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Ginkgo (Ground)

**Procedure**
Weight 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

**Reagents**
HNO₃

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Ginkgo (Whole Pill)

Procedure
Weigh 1 pill (approx 1.0 g) into the digestion vessel. Add 10 mL of HNO₃ and 2 mL of H₂O₂. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

Reagents
- HNO₃
- H₂O₂

Max Sample Weight
1 Pill (Approx 1.0 g)

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Hydrocodone

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃ and 1 mL HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HNO₃
HCl

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Ibuprofen (Ground)

**Procedure**

Weigh 0.3 g of the sample into the digestion vessel. Add 8 mL HNO₃ and 2 mL HF. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

**Notes**

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

**Reagents**

- HNO₃
- HF

**Max Sample Weight**

0.3 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless and particle free upon dilution to 50 mL.

**General Precaution**

- a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
- b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
- c) The control / reference vessel must contain the largest and most reactive sample.
- d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
- e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Kelp

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃ and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Reagents**

HNO₃
HCl

**Recommended Equipment**

MARS 6
MARS 6 iWave

**Recommended Vessels**

EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Losartan K

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃ and 2 mL of H₂O₂ (30%). Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 ml) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Recommended Reagents
HNO₃
H₂O₂ (30%)

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Magnesium Carbonate

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃, and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
Allow any reaction to subside before sealing the vessel.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

Recommended Equipment
- MARS 6
- MARS 6 iWave

Reagents
- HNO₃
- HCl

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Magnesium Oxide

Procedure

Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃ and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment

MARS 6
MARS 6 iWave

Recommended Vessels

EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Reagents

HNO₃
HCl

Max Sample Weight

0.5 g

Sample Type

Organic

Control Type

Ramp to Temperature

Method Type

One Touch

Heating Program

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*Ramp times and power may vary depending on the type and number of vessels.

Results

Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Manganese Carbonate

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃ and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃
HCl

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Medroxyprogesterone

**Procedure**

Weigh 0.3 g of the sample into the digestion vessel. Add 9 mL of HNO₃ and 1 mL HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**

- HNO₃
- HCl

**Max Sample Weight**

0.3 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Metformin (Ground)

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃ and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃
HCl

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Mineral Oil

**Procedure**

Weigh 0.25 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**

- HNO₃

**Max Sample Weight**

0.25 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Multivitamin (Ground)

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃ and 1 mL HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Reagents
HNO₃
HCl

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program
<table>
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<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
<th>Pressure (psi)</th>
<th>* Power (W)</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of 
**Multivitamin (Whole)**

**Procedure**
Weigh 1 pill (Approx 2.5 g) into the digestion vessel. Add 10 mL of HNO₃ and 2 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**
MARS 6  
MARS 6 iWave

**Recommended Vessels**
EasyPrep  
EasyPrep Plus

**Reagents**
HNO₃  
HCl

**Max Sample Weight**
1 Pill (Approx 2.5 g)

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

<table>
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<th>Stage</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Naproxen Sodium

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃ and 1 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides.

**Notes**

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus

**Reagents**

- HNO₃
- HF

**Heating Program**

<table>
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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
**Microwave Digestion of Niacinamide**

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃, and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**
- HNO₃
- HCl

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

<table>
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<tr>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Pantothenic Acid

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃, and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**
- HNO₃
- HCl

**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Potassium Chelate

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃, and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Reagents
HNO₃
HCl

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
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</tbody>
</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Protopic Ointment

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃ and 1 mL HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

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<tr>
<th>Recommended Equipment</th>
<th>Recommended Vessels</th>
<th>Reagents</th>
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<tr>
<td>MARS 6</td>
<td>EasyPrep</td>
<td>HNO₃</td>
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<tr>
<td>MARS 6 iWave</td>
<td>EasyPrep Plus</td>
<td>HCl</td>
</tr>
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</table>

**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

<table>
<thead>
<tr>
<th>Stage</th>
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</tbody>
</table>

*Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Pyridoxine

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃, and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment

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Recommended Vessels

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<th>Reagents</th>
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</thead>
<tbody>
<tr>
<td>HNO₃</td>
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<tr>
<td>HCl</td>
</tr>
</tbody>
</table>

Max Sample Weight

| 0.5 g |

Sample Type

| Organic |

Control Type

| Ramp to Temperature |

Method Type

| One Touch |

Heating Program

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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Riboflavin

Procedure
Weigh 0.25 g of the sample into the digestion vessel. Add 9 mL of HNO₃, and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Reagents
HNO₃
HCl

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HNO₃
HCl

Max Sample Weight
0.25 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Selenium Chelate

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃, and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃
HCl

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Sleep Aid

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃ and 1 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides.

Notes
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HNO₃
HF

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Sodium Polystyrene Sulfonate in iPrep

**Procedure**

Weigh 0.3 g of the sample into the digestion vessel. Add 6 mL of HNO₃ and 2 mL of deionized H₂O. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

This application can only be run in the iPrep vessel.

**Recommended Equipment**

MARS 6 iWave

**Recommended Vessels**

iPrep

**Reagents**

DI H₂O

HNO₃

**Max Sample Weight**

0.3 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

<table>
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<th>Heating Program</th>
<th>Stage</th>
<th>Temp (°C)</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear and colorless upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Stearic Acid

**Procedure**

Weigh 0.25 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus

**Reagents**

- HNO₃

**Max Sample Weight**

0.25 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of **Sudan Orange (4-Fluorophenyl) in iPrep**

**Procedure**
Weigh 0.25 g of the sample into the digestion vessel. Add 9 mL of HNO₃ and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

**Notes**
This application can only be run in the iPrep vessel.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**
MARS 6 iWave

**Recommended Vessels**
iPrep

**Reagents**
HNO₃
HCl

**Max Sample Weight**
0.25 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Thiamine

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃ and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃
HCl

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Transdermal Patch

Procedure
Weigh 0.1 g of the sample into the digestion vessel. Add 9 mL of HNO$_3$, 1 mL of HCl, and 0.1 g of NH$_4$F. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
This procedure uses ammonium fluoride, which creates in-situ hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes.

Reagents
HNO$_3$
HCl
NH$_4$F

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSXpress Plus

Recommended Equipment
- MARS 6
- MARS 6 iWave

Max Sample Weight
0.1 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Completed samples were clear, colorless and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Trixie Phosphate in iPrep

**Procedure**

Weigh 50 mg of the sample into the digestion vessel. Add 6 mL of HNO₃ and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

**Notes**

This application can only be run in the iPrep vessel.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

MARS 6 iWave

**Recommended Vessels**

iPrep

**Reagents**

HNO₃

HCl

**Max Sample Weight**

50 mg

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
USP 232/233 (Pharmaceuticals)

**Procedure**

Weigh 0.2 g of the sample into the digestion vessel. Add 9 mL of HNO₃, and 1 mL HCl. Gently swirl the mixture before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

MARS 6
MARS 6 iWave

**Recommended Vessels**

EasyPrep
EasyPrep Plus
MARSxpress
MARSXpress Plus

**Reagents**

HNO₃
HCl

**Max Sample Weight**

0.2 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Vitamin B-12

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃, and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

MARS 6  
MARS 6 iWave

**Recommended Vessels**

EasyPrep  
EasyPrep Plus  
MARSXpress  
MARSXpress Plus

**Reagents**

HNO₃  
HCl

**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Vitamin C (Ground)

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents
HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Vitamin C (Whole)

**Procedure**

Weigh 1 pill (Approx 1.4 g) into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**

MARS 6
MARS 6 iWave

**Recommended Vessels**

EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

**Reagents**

HNO₃

**Max Sample Weight**

1 Pill (Approx 1.4 g)

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control/ reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Vitamin Concentrate (High Fe)

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 5 mL of HNO3 and 5 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 ml) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

Reagents
- HNO3
- HCl

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Vitamin D

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of $\text{HNO}_3$, and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

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<th>Recommended Equipment</th>
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<td>HNO$_3$</td>
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**Max Sample Weight**
0.5 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

### Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Vitamin D3

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃ and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

Reagents
- HNO₃
- HCl

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Vitamin E

Procedure
Weigh 0.25 g of the sample into the digestion vessel. Add 9 mL of HNO₃, and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HNO₃
HCl

Max Sample Weight
0.25 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Vitamins

Procedure
Weigh 0.5 g (0.25 g w/Xpress Vessels) of the sample into the digestion vessel. Add 9 mL of HNO₃, 1 mL HCl, and 1 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled “Boric Acid HF Neutralization”.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Reagents
HNO₃
HF
HCl

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Zinc Sulfate

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO$_3$ and 1 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

Reagents
- HNO$_3$
- HCl

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Plastics, Polymers, & Oils
Microwave Digestion of Acrylamide

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO$_3$. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

<table>
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<th>MARS 6</th>
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<tr>
<td>MARS 6 iWave</td>
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</table>

**Recommended Vessels**

| EasyPrep |
| EasyPrep Plus |
| MARSxpress |
| MARSxpress Plus |

**Reagents**

HNO$_3$

**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Brominated Flame Retardant in iPrep

Procedure
Weigh 50 mg of the sample into the digestion vessel. Insert stir bar into the vessel. Add 4.5 mL H$_2$SO$_4$ and 4.0 mL HNO$_3$ to the vessel, then add 1.5 mL H$_2$O$_2$ dropwise. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
This application can only be run in the iPrep vessel.
Stirring is required for complete dissolution of this sample type.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
H$_2$SO$_4$
HNO$_3$
H$_2$O$_2$

Max Sample Weight
50 mg

Sample Type
Standard

Control Type
Ramp to Temperature

Method Type
Classic

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear and colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Bunker Oil in iPrep

**Procedure**
Weigh 0.3 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

**Notes**
This application can only be run in the iPrep vessel.
The pre-digestion step will allow the lighter fuel fractions to react before sealing the vessels.

**Recommended Equipment**
MARS 6 iWave

**Recommended Vessels**
iPrep

**Reagents**
HNO₃

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**Heating Program**

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*Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Char - Sulfuric Acid

Procedure
Add 6 mL H₂SO₄ into the vessel that contains the sample and acid.

Notes
EasyPrep Plus requires a high temperature probe for this method.

This method is for the pretreatment of large sample sizes or difficult organic samples that are resistant to oxidation. After the char is complete, the vessel is opened and a normal oxidation with HNO₃ can be run, usually at around 200°C.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
H₂SO₄

Max Sample Weight
Varies by sample

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
See sample specific method notes.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Crude Oil

**Procedure**

Weigh 0.2 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

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**Reagents**

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**Max Sample Weight**

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**Sample Type**

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**Method Type**

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**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Diesel Fuel

**Procedure**

Weigh 0.25 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

**Notes**

The pre-digestion step will allow the lighter fuel fractions to react before sealing the vessels.

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus

**Reagents**

- HNO₃

**Max Sample Weight**

0.25 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Epoxy Hardener

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

MARS 6
MARS 6 iWave

**Recommended Vessels**

EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

**Reagents**

HNO₃

**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.c) The control / reference vessel must contain the largest and most reactive sample.d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Fatty Alcohol

**Procedure**
Weigh 0.1 g of the sample into the digestion vessel. Add 2 mL of HNO₃ and 4 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**
- HNO₃
- HCl

**Max Sample Weight**
0.1 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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*Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Fluorinated Ethylene Propylene (FEP) in iPrep

**Procedure**
Weigh 120 mg of the sample into the digestion vessel. Add 4.5 mL of H₂SO₄, 4 mL of HNO₃, and 1.5 mL of H₂O₂ slowly. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
This application can only be run in the iPrep vessel.

### Recommended Equipment
MARS 6 iWave

### Recommended Vessels
iPrep

### Reagents
H₂SO₄
HNO₃
H₂O₂

### Max Sample Weight
120 mg

### Sample Type
Organic

### Control Type
Ramp to Temperature

### Method Type
One Touch

### Heating Program
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* Ramp times and power may vary depending on the type and number of vessels.

### Results
Sample was clear and colorless upon dilution to 50 mL.

### General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Fuel Oil (Slurry) in iPrep (Step 1 of 2)

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 9 mL of HNO₃ and 1 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides.

**Notes**

This application can only be run in the iPrep vessel.

This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid or other neutralization step should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

**Recommended Equipment**

MARS 6 iWave

**Recommended Vessels**

iPrep

**Reagents**

HNO₃

HF

**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

<table>
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<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
<th>Pressure (psi)</th>
<th>* Power (W)</th>
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</tbody>
</table>

* Ramp times and power may vary depending on the type and number of vessels.
Microwave Digestion of
Fuel Oil (Slurry) in iPrep (Step 2 of 2)

**Procedure**
Allow vessels to cool. Open and add 2 mL H₂O₂ (30%) dropwise. Wait approximately 15 minutes before closing the vessel.

**Notes**

**Reagents**
H₂O₂ (30%)

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear and colorless upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as one touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Gasoline

### Procedure
Add 0.1 g of the sample into the digestion vessel. Slowly add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

### Notes
The pre-digestion step will allow the lighter fuel fractions to react before sealing the vessels.

<table>
<thead>
<tr>
<th>Recommended Equipment</th>
<th>Recommended Vessels</th>
<th>Reagents</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARS 6</td>
<td>EasyPrep</td>
<td>HNO₃</td>
</tr>
<tr>
<td>MARS 6 iWave</td>
<td>EasyPrep Plus</td>
<td></td>
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<tr>
<td></td>
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<td></td>
<td>MARSXpress Plus</td>
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<table>
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<th>Max Sample Weight</th>
<th>Sample Type</th>
<th>Control Type</th>
<th>Method Type</th>
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<tbody>
<tr>
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</table>

*Ramp times and power may vary depending on the type and number of vessels.

### Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

### General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Glycerol Ester of Wood Rosin (Ground) in iPrep

Procedure
Weigh 0.5 g (ground) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes to predigest before closing the vessel.

Notes
This application can only be run in the iPrep vessel.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL with deionized water.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of HDPE

**Procedure**

Weigh 0.25 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus

**Reagents**
- HNO₃

<table>
<thead>
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<th>Max Sample Weight</th>
<th>Sample Type</th>
<th>Control Type</th>
<th>Method Type</th>
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<tbody>
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<td>One Touch</td>
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**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Kerosene

Procedure
Weigh 0.25 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

Notes
The pre-digestion step will allow the lighter fuel fractions to react before sealing the vessels.

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

Reagents
- HNO₃

Max Sample Weight
- 0.25 g

Sample Type
- Organic

Control Type
- Ramp to Temperature

Method Type
- One Touch

Heating Program

<table>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
**Microwave Digestion of Kevlar in iPrep**

**Procedure**
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

**Notes**
This application can only be run in the iPrep vessel.
Ensure that all fibers are completely covered with acid and not adhered to the vessel liner wall.

<table>
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<th>Max Sample Weight</th>
<th>Sample Type</th>
<th>Control Type</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Lube Oil

**Procedure**
Weigh 0.25 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus

**Reagents**
HNO₃

**Max Sample Weight**
0.25 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Methyl Ester of Hydrogenated Wood Rosin (Ground) in iPrep

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes to predigest before closing the vessel.

Notes
This application can only be run in the iPrep vessel.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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<th>Stage</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL with deionized water.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Mineral Oil

Procedure
Weigh 0.25 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Relevant Equipment
MARS 6
MARS 6 iWave

Relevant Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Reagents
HNO₃

Max Sample Weight
0.25 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Motor Oil (New)

Procedure
Weigh 0.25 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

<table>
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<tr>
<th>Recommended Equipment</th>
<th>Recommended Vessels</th>
<th>Reagents</th>
</tr>
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<tbody>
<tr>
<td>MARS 6</td>
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<td>HNO₃</td>
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<tr>
<td>MARS 6 iWave</td>
<td>EasyPrep Plus</td>
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<tr>
<th>Max Sample Weight</th>
<th>Sample Type</th>
<th>Control Type</th>
<th>Method Type</th>
</tr>
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<tbody>
<tr>
<td>0.25 g</td>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Motor Oil (Waste)

**Procedure**
Weigh 0.25 g (0.1 g w/Xpress Vessels) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

**Notes**
The pre-digestion step will allow the lighter fuel fractions to react before sealing the vessels.

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**
- HNO₃

**Max Sample Weight**
- 0.25 g

**Sample Type**
- Organic

**Control Type**
- Ramp to Temperature

**Method Type**
- One Touch

<table>
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<tr>
<th>Stage</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Motor Oil (Waste) in iPrep

Procedure
Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

Notes
This application can only be run in the iPrep vessel.
The pre-digestion step will allow the lighter fuel fractions to react before sealing the vessels.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HNO₃

Max Sample Weight
0.5 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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</table>

*Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Nylon

**Procedure**
Weigh 0.25 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture before closing the vessel.

**Notes**

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

**Reagents**
HNO₃

**Max Sample Weight**
0.25 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

<table>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Oil Wear Metals

Procedure
Weigh 0.25 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
- MARS 6
- MARS 6 iWave

Recommended Vessels
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

Reagents
- HNO₃

Max Sample Weight
- 0.25 g

Sample Type
- Organic

Control Type
- Ramp to Temperature

Method Type
- One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of PET (Polyethylene Terephthalate)

**Procedure**

Weigh 0.2 g of the sample into the digestion vessel. Add 8 mL of HNO₃ and 2 mL of H₂SO₄. Gently swirl the mixture before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus

**Reagents**
- HNO₃
- H₂SO₄

**Max Sample Weight**
- 0.2 g

**Sample Type**
- Organic

**Control Type**
- Ramp to Temperature

**Method Type**
- One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of PET (Polyethylene Terephthalate) in iPrep

Procedure
Weigh 0.4 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

Notes
This application can only be run in the iPrep vessel.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HNO₃

Max Sample Weight
0.4 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of 
**Petrolatum**

### Procedure

Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

### Notes

### Recommended Equipment

- MARS 6
- MARS 6 iWave

### Recommended Vessels

- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

### Reagents

- HNO₃

### Max Sample Weight

- 0.5 g

### Sample Type

- Organic

### Control Type

- Ramp to Temperature

### Method Type

- One Touch

### Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

### Results

Sample was clear, colorless, and particle free upon dilution to 50 mL.

### General Precaution

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Plasticizer (Filter) in iPrep

**Procedure**

Weigh 0.2 g of the sample into the digestion vessel. Add 6 mL HNO₃ and 3 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

**Notes**

This application can only be run in the iPrep vessel.

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<th>Control Type</th>
<th>Method Type</th>
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</table>

* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Plasticizers in iPrep

**Procedure**

Weigh 0.2 g of the sample into the digestion vessel. Add 6 mL HNO₃ and 3 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**Notes**

This application can only be run in the iPrep vessel.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes.

**Recommended Equipment**

MARS 6 iWave

**Recommended Vessels**

iPrep

**Reagents**

HNO₃
HCl

**Recommended Vessels**

iPrep

**Max Sample Weight**

0.2 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Polycarbonate Resin (Step 1 of 2)

Procedure
Char Step
Weigh 1.0 g of the sample into the digestion vessel. Add 6 mL of H₂SO₄. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes
Easy Prep Plus requires a high temperature probe for this method.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
H₂SO₄

Max Sample Weight
1.0 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.
Microwave Digestion of Polycarbonate Resin (Step 2 of 2)

Procedure
Proceeding step one, add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Reagents
HNO₃

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as one touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Polyethersulfone (Filter Paper)

Procedure
Weigh 1 filter paper (Approx 0.1 g) into the digestion vessel. Add 8 mL of HNO₃ and 2 mL H₂SO₄. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HNO₃
H₂SO₄

Max Sample Weight
1 Filter (Approx 0.1 g)

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

<table>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Polyethylene - High Density

**Procedure**
Weigh 0.25 g (0.1 g w/Xpress Vessels) of the sample into the digestion vessel. Add 10 ml of HNO₃. Gently swirl the mixture before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSXpress
- MARSXpress Plus

**Reagents**
- HNO₃

**Max Sample Weight**
0.25 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Polyphenylene Sulfide

**Procedure**

Weigh 0.25 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

<table>
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<tr>
<th>MARS 6</th>
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<tbody>
<tr>
<td>MARS 6 iWave</td>
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</table>

**Recommended Vessels**

| EasyPrep |
| EasyPrep Plus |
| MARSXpress |
| MARSXpress Plus |

**Reagents**

| HNO₃ |

**Max Sample Weight**

| 0.25 g |

**Sample Type**

| Organic |

**Control Type**

| Ramp to Temperature |

**Method Type**

| One Touch |

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Polypropylene

**Procedure**
Weigh 0.25 (0.1 g w/Xpress vessels) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

**Reagents**
- HNO₃

**Max Sample Weight**
- 0.25 g (0.1 g w/Xpress)

**Sample Type**
- Organic

**Control Type**
- Ramp to Temperature

**Method Type**
- One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Polyterpene Resin in iPrep

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes to predigest before closing the vessel.

**Notes**

This application can only be run in an iPrep.

**Recommended Equipment**

MARS 6 iWave

**Recommended Vessels**

iPrep

**Reagents**

HNO₃

**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

<table>
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<th>Stage</th>
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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL with deionized water.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Polyurethane

**Procedure**

Weigh 0.5 g of the sample into the digestion vessel. Add 10 mL of HNO$_3$. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus

**Reagents**

- HNO$_3$

**Max Sample Weight**

0.5 g

**Sample Type**

Organic

**Control Type**

Ramp to Temperature

**Method Type**

One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Polyurethane in iPrep

Procedure
Weigh 0.2 g of the sample into the digestion vessel. Add 6 mL HNO₃, and 3 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes to pre-digest before closing the vessel.

Notes
This application can only be run in the iPrep vessel.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6 iWave

Recommended Vessels
iPrep

Reagents
HNO₃
HCl

Max Sample Weight
0.2 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of PVC (Polyvinyl Chloride Resin)

Procedure

Weigh 0.25 g (0.1 g w/Xpress Vessels) of sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture before closing the vessel.

Notes

Recommended Equipment

MARS 6
MARS 6 iWave

Recommended Vessels

EasyPrep
EasyPrep Plus
MARSxpress
MARSxpress Plus

Reagents

HNO₃

Max Sample Weight

0.25 g

Sample Type

Organic

Control Type

Ramp to Temperature

Method Type

One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results

Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Rubber

**Procedure**

Weigh 0.25 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**

- MARS 6
- MARS 6 iWave

**Recommended Vessels**

- EasyPrep
- EasyPrep Plus

**Reagents**

- HNO₃

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**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**

Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.

b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.

c) The control / reference vessel must contain the largest and most reactive sample.

d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.

e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Rubber (Synthetic)

Procedure
Weigh 0.25 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HNO₃

Max Sample Weight
0.25 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Silane Terminated Polyether in iPrep

Procedure

Weigh 0.2 g of the sample into the digestion vessel. Add 6 mL HNO₃ and 3 mL of HCl. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

This application can only be run in the iPrep vessel.

The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes.

Recommended Equipment

MARS 6 iWave

Recommended Vessels

iPrep

Reagents

HNO₃
HCl

Max Sample Weight

0.2 g

Sample Type

Organic

Control Type

Ramp to Temperature

Method Type

One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results

Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
d) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Silicone Tubing - TiO$_2$ Filler

**Procedure**
Weigh 0.2 g of the sample into the digestion vessel. Add 2 mL HNO$_3$ and 5 mL of HF. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Add HF slowly, and allow vessels to stand in the fume hood until the initial reaction subsides.

**Notes**
This procedure uses hydrofluoric acid. If it is necessary to complex the residual hydrofluoric acid or redissolve insoluble fluorides formed, an additional complexation step with boric acid should be used. This procedure can be found in the One Touch Method note entitled "Boric Acid HF Neutralization".

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus

**Reagents**
- HNO$_3$
- HF

**Max Sample Weight**
0.2 g

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Styrene Acrylate

Procedure
Weigh 0.25 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Reagents
HNO₃

Max Sample Weight
0.25 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Terephthalic Acid

Procedure
Weigh 0.2 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HNO₃

Max Sample Weight
0.2 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Wax (Petroleum Based)

Procedure
Weigh 0.25 g of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus

Reagents
HNO₃

Max Sample Weight
0.25 g

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Water & Wastewater Treatment
**Microwave Digestion of NPDES (Waste Water)**

### Procedure
Transfer 50 mL of the sample into the digestion vessel. Add 3 mL of HNO₃, and 2 mL HCl. Gently swirl the mixture before closing the vessel.

### Notes
The addition of Conc. HCl (0-4mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

### Recommended Equipment
- MARS 6
- MARS 6 iWave

### Recommended Vessels
- 75 mL MARSXpress
- EasyPrep
- EasyPrep Plus
- MARSXpress Plus

### Reagents
- HNO₃
- HCl

### Max Sample Weight
50 mL

### Sample Type
Water

### Control Type
Ramp to Temperature

### Method Type
One Touch

### Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

### Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

### General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Sludge (Industrial)

**Procedure**
Weigh 0.5 g (dry weight) of the sample into the digestion vessel. Add 10 mL of HNO₃. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**
The use of HF may be required to digest any silicates found in the sample.

The addition of Conc. HCl (0-4 ml) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

**Recommended Equipment**
MARS 6
MARS 6 iWave

**Recommended Vessels**
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

**Reagents**
HNO₃

**Max Sample Weight**
0.5 g (Dry Weight)

**Sample Type**
Organic

**Control Type**
Ramp to Temperature

**Method Type**
One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of TCLP Extract

**Procedure**
Transfer 25 mL of the sample into the digestion vessel. Add 5 mL of HNO₃. Gently swirl the mixture before closing the vessel.

If a high organic content is suspected, a 10 mL sample volume is recommended.

**Notes**

**Recommended Equipment**
- MARS 6
- MARS 6 iWave

**Recommended Vessels**
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

**Reagents**
- HNO₃

**Max Sample Weight**
- 25 mL

**Sample Type**
- Water

**Control Type**
- Standard Control

**Method Type**
- One Touch

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
US EPA 3015 (Aqueous Samples)

Procedure
Transfer 45 mL of the sample into the digestion vessel. Add 5 mL of HNO₃. Gently swirl the mixture before closing the vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
75 mL MARSXpress
EasyPrep Plus
MARSXpress Plus

Reagents
HNO₃

Max Sample Weight
45 mL

Sample Type
Water

Control Type
Standard Control

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
This method is intended to be an acid leach, not a total digest. Hydrofluoric acid will be required to provide complete digestion of the sample matrix.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
US EPA 3015a (Aqueous Sample)

Procedure
Transfer 45 mL of the sample into the digestion vessel. Add 5 mL of HNO3, or alternatively 4 mL of HNO3 and 1 mL HCl. Gently swirl the mixture before closing the vessel.

Notes
The addition of Conc. HCl (0-4 mL) is appropriate for the stabilization of Ag, Ba and Sb, and high concentrations of Fe and Al in solution. The amount of HCl will vary depending on the matrix and the concentration of the analytes. The addition of HCl may, however, limit the techniques or increase the difficulties of analysis.

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
75 mL MARSXpress
EasyPrep Plus
MARSXpress Plus

Reagents
HNO3
HCl (Optional)

Max Sample Weight
45 mL

Sample Type
Water

Control Type
Standard Control

Method Type
One Touch

Heating Program

<table>
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<tr>
<th>Stage</th>
<th>Temp (°C)</th>
<th>*Ramp (mm:ss)</th>
<th>Hold (mm:ss)</th>
<th>Pressure (psi)</th>
<th>* Power (W)</th>
<th>Stirring</th>
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<tbody>
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<td>170</td>
<td>10:00</td>
<td>10:00</td>
<td>800</td>
<td>900-1800</td>
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* Ramp times and power may vary depending on the type and number of vessels.

Results
This method is intended to be an acid leach, not a total digest. Hydrofluoric acid will be required to provide complete digestion of the sample matrix.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of
Waste Activated Sludge

Procedure
Weigh 0.5 g (dry weight) (0.25 g w/Xpress Vessels) of the sample into the digestion vessel. Add 5 mL of HNO₃, and 5 mL of H₂O₂. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

Notes

Recommended Equipment
MARS 6
MARS 6 iWave

Recommended Vessels
EasyPrep
EasyPrep Plus
MARSXpress
MARSXpress Plus

Reagents
HNO₃
H₂O₂

Max Sample Weight
0.5 g (Dry Weight)

Sample Type
Organic

Control Type
Ramp to Temperature

Method Type
One Touch

Heating Program

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* Ramp times and power may vary depending on the type and number of vessels.

Results
Sample was clear, colorless, and particle free upon dilution to 50 mL.

General Precaution
a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.
Microwave Digestion of Water (For Analysis of Phosphorous)

**Procedure**
Transfer 50 mL of H₂O into the digestion vessel. Add 0.5 g of K₂S₂O₈ and 1 mL of H₂SO₄. Gently swirl the mixture and wait approximately 15 minutes before closing the vessel.

**Notes**

**Recommended Equipment**
MARS 6

**Recommended Vessels**
- EasyPrep
- EasyPrep Plus
- MARSxpress
- MARSxpress Plus

**Reagents**
- K₂S₂O₈
- H₂SO₄

**Max Sample Weight**
50 mL

**Sample Type**
Water

**Control Type**
Ramp to Temperature

**Method Type**
Classic

**Heating Program**

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* Ramp times and power may vary depending on the type and number of vessels.

**Results**
Sample was clear, colorless, and particle free upon dilution to 50 mL.

**General Precaution**

a) This procedure is a reference point for sample digestion using a CEM system and may need to be modified or changed to obtain the required results on your sample.
b) If using a vessel other than the recommended choice, adjust sample size and pressure limit to values appropriate for the vessel chosen.
c) The control / reference vessel must contain the largest and most reactive sample.
d) Manual venting of CEM vessels should be performed when wearing hand/eye/body protection and when the vessel contents are at or below room temperature to avoid the potential for chemical burns. Always point the vent hole away from the operator.
e) If programming as One Touch, the ramp time and power will be automatically determined based on the number and type of vessels detected.