

# Application Note - Digestion of Waste Water Samples

## Introduction:

This study evaluated the effectiveness of the **MiniWAVE** microwave digestion system for the digestion of waste water samples.

## Sample Type:

SCP SCIENCE **EnviroMAT** Waste Water, high (EU-H-3)

- Sample volume: 1 ml
- 4 Replicates

## Supplies and Reagents:

- 1) Microwave digestion system, **MiniWAVE** Model\*
- 2) Quartz Vessels\*, 75ml
- 3) Fluoropolymer Caps and Safety Pressure Release Caps\*
- 4) **PlasmaPURE** HNO<sub>3</sub> (70%), 5 ml
- 5) ICP-MS Spectrometer, Elmer ELAN 6100, Perkin-Elmer
- 6) Crossflow Nebulizer, Mini-X-Flow\*
- 7) Torch with Alumina Injector, 1.2mm\*
- 8) Cyclonic Spray Chamber, Baffled\*

\* Manufactured by SCP SCIENCE

## Sample Preparation Procedure:

The waste water sample (1 ml) was measured with a digital pipette and transferred into a 75 ml quartz vessel. After adding 45 ml of DI water and 5 ml of HNO<sub>3</sub>, the sample was digested in the **MiniWAVE** following the instrument's heating profile noted below. After cooling, the samples were analyzed on the ICP-MS.

## Heating Program:

STAGE	RAMP TIME (MINUTES)	PRESSURE (PSI-LIMIT)	TEMPERATURE (°C)	HOLD TIME (MINUTES)
1	20	435	170	30

MiniWAVE  
Microwave Digestion Made Easy

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## Recoveries:

ELEMENT	AMU	MiniWAVE (PPM)	RSD (%)	CERTIFIED VALUE (PPM)	RECOVERY (%)
Al	27	0.352	2.2	0.343	102
As	75	0.686	1.2	0.649	105
B	11	0.625	1.3	0.596	104
Ba	138	0.957	1.5	0.942	101
Be	9	0.415	1.3	0.392	105
Ca	43	36.5	3.5	34.7	105
Cd	111	0.237	1.4	0.228	103
Co	59	0.420	1.3	0.442	95
Cr	52	0.362	1.1	0.348	103
Cu	63	0.694	1.5	0.658	105
Fe	57	0.469	1.2	0.491	96
K	39	39.2	1.9	40.1	98
Mg	24	16.1	1.7	17.6	92
Mn	55	0.408	1.2	0.392	104
Mo	98	0.623	1.4	0.625	99
Na	23	39.5	1.7	38.3	103
Ni	62	0.643	1.2	0.647	99
P	31	7.85	2.6	8.63	92
Pb	206	0.522	1.4	0.532	98
Sb	121	0.505	1.2	0.478	105
Se	82	0.113	1.6	0.116	97
Sr	88	0.828	1.2	0.786	105
Tl	205	0.357	1.2	0.342	104
V	51	0.725	1.1	0.701	103
Zn	68	0.804	1.1	0.771	104

## Conclusion:

The **MiniWAVE** is suitable for the digestion of waste water samples. Good recoveries are achieved in an efficient amount of time.

By:

René-Viet Nguyen, Ph.D, P. Chem.

Application Chemist

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www.scpscience.com  
sales@scpscience.com

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### CANADA / USA

Tel.: (800) 361-6820  
Fax: (800) 253-5549

### FRANCE

Tel.: +33 (0) 1 69 18 71 17  
Fax: +33 (0) 1 60 92 05 67

### GERMANY

+49 (0) 8342-89560-61  
+49 (0) 8342-89560-69

### CHINA

Tel.: +86 (10) 58032301  
Fax.: +86 (10) 58032302

### INTERNATIONAL

Tel.: (514) 457-0701  
Fax: (514) 457-4499