Application Note - Digestion of Plastic CRM

Introduction:

This study evaluated the effectiveness of the ***Mini*WAVE** microwave digestion system for the digestion of polyethylene samples.

Sample Type:

Polyethylene CRM BCR-680 and BCR-681

- Sample weight: 0.1 g
- 4 Replicates

Supplies and Reagents:

1) Microwave digestion system, ***Mini*WAVE** Model*
2) Quartz Vessels, 75 ml*
3) Fluoropolymer Caps and Safety Pressure Release Caps*
4) ***Plasma*PURE** HNO_3 (70%), 10 ml
5) ***Plasma*PURE** H_2O_2 (30%), 1 ml
6) ICP-MS Spectrometer, ELAN 6100, Perkin-Elmer
7) Crossflow Nebulizer, Mini-X-Flow*
8) Alumina torch injector, 1.2 mm*
9) Cyclonic Spray Chamber, Baffled*

* Manufactured by **SCP SCIENCE**

Sample Preparation Procedure:

The samples were weighed on a 4 place analytical balance directly in the quartz vessel. After adding 10 ml of HNO_3 and 1 ml of H_2O_2 the samples were allowed to sit at room temperature for 5-10 minutes. They were placed in the rack and digested following the heating profile. After cooling down to room temperature, the samples were vented, diluted and analyzed on the ICP-MS.

Heating Program:

STAGE	RAMP TIME (MINUTES)	PRESSURE (PSI-LIMIT)	TEMPERATURE (ºC)	HOLD TIME (MINUTES)
1	15	435	200	20

MiniWAVE

Microwave Digestion Made Easy

Application Note - Digestion of Plastic CRM

Results:

BCR-680

ELEMENT	AMU	*Mini*WAVE (PPM)	RSD (%)	BCR-680 (PPM)	RECOVERY (%)
As	75	31.4	2.2	30.9	101
Cd	111	137.7	1.5	140.8	98
Cr	52	125.7	1.1	114.6	109
Hg	202	23.3	2.0	25.3	92
Pb	206	109.3	1.1	107.6	101

BCR-681

ELEMENT	AMU	*Mini*WAVE (PPM)	RSD (%)	BCR-680 (PPM)	RECOVERY (%)
As	75	31.51	2.7	3.93	90
Cd	111	20.2	2.6	21.7	93
Cr	52	19.2	1.3	17.7	108
Hg	202	4.71	2.2	4.5	105
Pb	206	15.0	1.6	13.8	109

Conclusion:

The ***Mini*WAVE** is suitable for the digestion of polyethylene samples. Good recoveries are achieved in an efficient amount of time.

References:

Certificate of Analysis SC9261560 from **SCP SCIENCE**
Certificate of Analysis NIST CRM 1059c
USCPSC-CH-E1001-08 method

By:
René-Viet Nguyen, Ph.D, P. Chem.
Application Chemist

MiniWAVE
Microwave Digestion Made Easy

MK-APP_NOTES_PLASTIC CRM DIGESTION-1.0-E

www.scpscience.com
sales@scpscience.com

SCP SCIENCE
Providing Innovative Solutions to Analytical Chemists

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