

Application Note - Digestion of Chocolate Chips

Introduction:

This study evaluated the effectiveness of the *NOVAWAVE* microwave digestion system to digest food samples.

Sample Type:

Chocolate chips

- Sample weight: 0.25-0.50 g
- 3 replicates

Supplies and Reagent:

- 1) Microwave Digestion System, *NOVAWAVE* SA Model*
- 2) Quartz Vessels, 75 ml, calibrated at 50ml*
- 3) Teflon® Caps and Safety Pressure Release Caps (pre-set release pressure 435psi) (or 30 bar)*
- 4) Nitric Acid, *Plasma*PURE HNO₃ (70%)*
- 5) ICP-MS Spectrometer, ELAN 6100, Perkin-Elmer
- 6) Nebulizer*
- 7) Alumina Injector Torch, 1.2mm*
- 8) Cyclonic Spray Chamber, Baffled*
- 9) Graduated Cylinder, Corning
- 10) Volumetric flask, 100 ml

* Manufactured by SCP SCIENCE

Sample Preparation Procedure:

The samples were weighed on a 4 place analytical balance directly in the 75 ml quartz vessels. After adding 10ml of HNO₃ and the appropriate spike, the samples were allowed to sit at room temperature for 5-10 minutes. The vessels were placed in the rack, capped and digested following the *NOVAWAVE* heating profile. At the end of the digestion, the solutions were clear and no particulates remain. After cooling to room temperature, the rack was vented carefully in a fumehood. The samples were normalized to 100 ml with deionized water in a volumetric flask and analyzed on the ICP-MS.

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A new category of Automated Microwave Digestion

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NOVAWAVE Heating Program :

STAGE	RAMP TIME (Minutes)	PRESSURE (PSI – LIMIT)	TEMPERATURE °C	HOLD TIME (Minutes)
1	20	435	200	15

Results:

Chocolate Chips

EL.	AMU	NOVAWAVE (PPM)	SPIKE (PPM)	NOVAWAVE SPIKE SAMPLE 1 (PPM)	NOVAWAVE SPIKE SAMPLE 2 (PPM)	NOVAWAVE SPIKE SAMPLE (PPM)	RECOVERY (%)
As	75	0.003	0.025	0.033	0.025	0.029	104
Cd	111	0.002	0.5	0.501	0.525	0.513	102
Hg	202	0.0007	0.025	0.028	0.018	0.023	92
Pb	206	0.002	0.5	0.509	0.525	0.517	103

Conclusion

The *NOVAWAVE* affords good results according to the spiked standard addition method. All recovery are within 80-120% of the spiked value.

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