

# Application Note - The Digestion of Peach Leaves

## **Introduction:**

This study evaluated the effectiveness of the new *NOVAWAVE* microwave digestion system. The study entailed the digestion of Peach Leaves, a NIST Certified Reference Material, and demonstrated the effectiveness of the digestion and the analysis through an evaluation of metal recoveries and comparison to the certified values.

## **Sample Type:**

Dried Peach Leaves prepared by N.I.S.T. (CRM 1547; Certificate Date: January 22<sup>th</sup>, 1993.)

- Sample weights: 0.2 to 0.4 g
- 24 Replicates

## **Supplies and Reagent:**

- 1) *NOVAWAVE* Model SA \*
- 2) Quartz 50ml Vessels \*
- 3) Teflon® Caps and Safety Pressure Release Caps, pre-set release pressure at 30 bar (435 psi) \*
- 4) *PlasmaPURE* HNO<sub>3</sub> (70%), 10ml \*
- 5) Analytical Balance, 4 Decimal Places, Mettler-Toledo
- 6) Spectroflame Modula FMD-07 ICP-OES, Spectro Analytical
- 7) Mini X-Flow Nebulizer \*
- 8) 1.2mm Alumina Injector Torch \*
- 9) Baffled Cyclonic Spray Chamber \*
- 10) 10 ml Graduated Cylinder, Corning

## **Sample Preparation Procedure:**

The samples were digested following EPA 3051 Method protocols. The CRM was mixed in its container. A portion was placed in a beaker and dried in a desiccator with CaSO<sub>4</sub> (over 5 days) to ensure a stable mass. The samples were weighed on a 4 place analytical balance directly in the quartz vessels. After adding 10ml of HNO<sub>3</sub>, the samples were allowed to sit at room temperature for 5-10 minutes. They were then placed in the *NOVAWAVE* rack and digested following the instrument's heating profile noted below. After cooling, samples were then normalized to 50 ml with DI H<sub>2</sub>O.

## **Discussion:**

At the end of the digestion period and after cooling to room temperature, the vessels should be carefully vented in a fumehood. Some elements were not reported as their results were below their ICP-OES detection limits. Recoveries are reported for 24 replicates.

## ***NOVAWAVE* Heating Program:**

STAGE	RAMP TIME (Minutes)	PRESSURE (psi-limit)	TEMPERATURE (°C)	HOLD TIME (Minutes)
1	10	435	180	10

NOVAWAVE

A new category of Automated Microwave Digestion

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## Recoveries:

Element Symbol	Wavelength (nm)	NOVAWAVE Results (ppm)	Uncertainty (95% conf.) (ppm)	Certified Value (ppm)	Tolerance (ppm)	Recovery (%)
Al	396.15	252	± 5	249	± 8	101.2%
B	249.77	29	± 2	29	± 2	100.0%
Ba	455.40	125	± 6	124	± 4	100.8%
Ca	422.67	15629	± 636	15600	± 200	100.2%
Fe	259.94	219	± 11	218	± 14	100.5%
Mg	277.98	4335	± 170	4320	± 80	100.3%
Mn	257.61	97	± 4	98	± 3	99.0%
Sr	407.77	54	± 3	53	± 4	101.9%
Zn	213.86	18.0	± 0.8	17.9	± 0.4	100.6%

## Conclusions:

The *NOVAWAVE* microwave digestion system produced good RSDs and excellent recoveries.

## References:

- 1) Certificate of Analysis NIST 1547
- 2) EPA 3051 Microwave Digestion Method

\* Components manufactured by SCP SCIENCE.

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