

# NRC SPIN-1 Air Dried Spinach

## SUMMARY

The application note summarizes the digestion of SPIN-1, an air-dried spinach powder Certified Reference Material using ColdBlock™ Digestion Pro Series Technology.

**Instrument:** ColdBlock CBM sample digester, chiller & ICP-MS

**Published:** March 2023

**Digestion Time:** 10 Minutes

**Acid Used:** HNO<sub>3</sub> & H<sub>2</sub>O<sub>2</sub>

**Average ColdBlock Recovery vs. CRM:**

- 111% Arsenic
- 96% Cadmium
- 96% Lead

## METHODOLOGY

1. Chiller temperature was set to -5°C
2. 0.5g of each sample was weighed and placed into a ColdBlock™ Digestion vessel
3. 15 mL of HNO<sub>3</sub> + 2mL H<sub>2</sub>O<sub>2</sub> was added
4. Sample was digested at 70% power for 10 minutes
5. Samples were cooled and bulked to 40mL using 2% HNO<sub>3</sub> + 0.5% HCl<sub>v/v</sub>

## DISCUSSION

- Samples are mostly clear after digestion, and minor of amount of material settled on the bottom of the tube after bulking
- Samples were filtered prior to analysis



SPIN-1 was prepared at the National Research Council Canada from food grade air dried spinach powder

SPIN-1; Air Dried Spinach Powder; National Research Council Canada ; Ottawa, Ontario Canada (June, 2019)

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## Results

SPIN-1 (Air Dried Spinach Powder)										
Method:	0.5g	15mL HNO <sub>3</sub> + 2mL H <sub>2</sub> O <sub>2</sub> Digest at 60% power for 10 minutes.								
Element	Reference Value (mg/kg)	95% Confidence Limits		Sample A	Sample B	Sample C	Average (ppm)	Stdev	% RSD	% Recovery
		Low	High							
<b>As</b>	0.7	0.58	0.82	0.7	0.8	0.8	0.8	0.029	3.7%	111%
<b>Se</b>	0.062	0.03	0.094	0.056	0.074	0.077	0.069	0.009	13.4%	111%
<b>Cd</b>	0.265	0.235	0.295	0.227	0.266	0.268	0.254	0.019	7.4%	96%
<b>Pb</b>	2.33	1.99	2.67	2.24	2.31	2.16	2.24	0.063	2.8%	96%
<b>Sr</b>	140.8	130.9	150.7	151.5	155.6	158.0	155.0	2.717	1.8%	110%
<b>Zn</b>	40.7	38.7	42.7	45.2	41.7	36.6	39.1	2.515	6.4%	96%