

NIST 695 – Multi-Nutrient Fertilizer

SUMMARY

The application note summarizes the digestion of NIST 695, a Multi-Nutrient Fertilizer Standard Reference Material using ColdBlock™ Digestion CB15S Technology.

Instrument: ColdBlock CB15S sample digester, chiller, ICP-OES

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Digestion Time: 20 Minutes

Acid Used: Aqua Regia

Average ColdBlock Recovery vs. CRM:

- 101% Calcium
- 100% Potassium
- 98% Phosphorus

METHODOLOGY

1. Chiller temperature was set to -5° C
2. 1.0g of each sample was weighed and placed into a ColdBlock™ Digestion vessel
3. 40mL of Aqua Regia was added, and mixed with sample
4. Sample was digested at 80% power for 20 minutes
5. Sample was cooled and bulked to 50mL using 2% HNO₃ v/v

DISCUSSION

- During the digestion, the samples started climbing up the test tube but fell back down once they hit the cooling zone
- After 20 minutes of digestion, a trace amount of sample material remains
- Percent recoveries were calculated using total element content values certified by NIST

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Results

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Method:	1.0g	40mL Aqua Regia - Digest at 80% for 20 minutes			
Element	Certified Total Values (ppm)	ColdBlock Average (ppm)	Stdev	%RSD	% Recovery
As	200	184	0.22	0.1%	92%
Ca	22600	22840	195.73	0.9%	101%
Cd	16.9	15.9	0.04	0.2%	94%
Co	65.3	65.11	0.57	0.9%	100%
Cr	244	228	2.36	1.0%	93%
Cu	1225	1231	9.93	0.8%	100%
K	116200	116020	987.03	0.9%	100%
Mo	20	20	0.08	0.4%	100%
Ni	135	132	0.485	0.4%	98%
P*	72000	70552	506.23	0.7%	98%
Pb	273	278	3.985	1.4%	102%
Zn	3250	3257	21.41	0.7%	100%

* Indicates reference values