

# 20-20-20 (P-K-N) Fertilizer

## SUMMARY

The application note summarizes the digestion of a 20-20-20 (P-K-N) Fertilizer using ColdBlock™ Digestion CB15S Technology.

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**Instrument:** ColdBlock CB12L sample digester, chiller, ICP-OES

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**Digestion Time:** 10 Minutes

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**Acid Used:** HNO<sub>3</sub> & HCl

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**Average ColdBlock Recovery vs. CRM:**

- 100% Iron
- 110% Phosphorus
- 97% Potassium

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## 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. 10mL HCl + 10mL HNO<sub>3</sub> was added
4. Sample was digested at 80% power for 10 minutes
5. Sample was cooled and bulked to 50mL using Ultrapure water

## DISCUSSION

- After 20 minutes the samples were clear, and no visible sample material remains
- Sample material climbed the test tube during the digestion but fell back down with the condensation effect produced by the cooling zone

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### Results

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Method:	0.5g	10mL HCl + 10mL HNO3- Digest at 80% for 10 minutes.			
Element	Reference Values (wt.%)	ColdBlock Average (wt.%)	Stdev	% RSD	% Recovery
<b>B</b>	0.02	<b>0.02</b>	0.0005	2.3%	108%
<b>Cu</b>	0.05	<b>0.05</b>	0.0015	3.0%	100%
<b>Fe</b>	0.1	<b>0.1</b>	0.005	5.0%	100%
<b>K2O</b>	20	<b>19.5</b>	0.05	0.3%	98%
<b>Mn</b>	0.05	<b>0.05</b>	0.0025	5.0%	100%
<b>P2O5</b>	20	<b>22</b>	0.37	1.7%	110%
<b>Zn</b>	0.05	<b>0.05</b>	0.0001	0.2%	100%