

## APPLICATION NOTE

# OREAS-354 Zinc Concentrate

## SUMMARY

This application note is for the digestion of OREAS-354, a Zinc Concentrate.

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

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**Digestion Time:** 20 Minutes

**Acid Used:** Reverse Aqua Regia

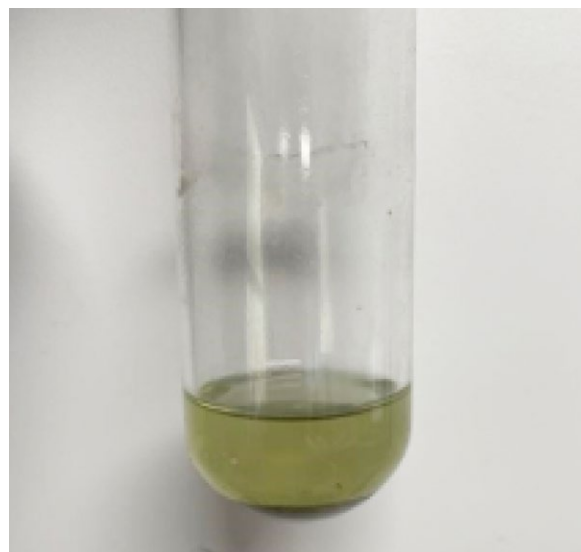
**Average ColdBlock Recovery vs. CRM:** ■ 100% Zinc ■ 103% Lead ■ 99% Sulfur

## METHODOLOGY

1. Chiller temperature was set to  $-5^{\circ}\text{C}$
2. 0.25g of OREAS-354 was weighed and placed into a ColdBlock digestion vessel
3. 20mL of Reverse Aqua Regia was added ( $\text{HNO}_3$  is added first, followed by the  $\text{HCl}$ )
4. Sample was digested at 80% power for 20 minutes
5. Sample was cooled and bulked to 50mL using 2%  $\text{HNO}_3$  v/v

## DISCUSSION

- Upon addition of  $\text{HNO}_3$ , the evolution of reddish brown ( $\text{NO}_2$ ) fumes occurred
- The evolution of  $\text{NO}_2$  fumes subsided near completion of the digestion, and the fumes turned white
- After 20 minutes, the samples are green in color and the digested solution appears slightly opaque
- After bulking up, a minor amount of material settled on the bottom of the tube
- Hydrofluoric Acid can be added for a near total digestion to improve the recoveries of certain elements
- Boric acid can also be added to re-solubilize any insoluble fluorides and help neutralize any remaining  $\text{HF}$ .
- For improved silver recoveries bulk up using a solution of 10-20%  $\text{HCl}$  v/v



*OREAS 354 after 20-minute digestion*

OREAS 354 is a certified reference material (CRM) sourced from zinc sulphide concentrate samples taken from the Dugald River metallurgical plant. The Dugald River deposit is located in the Mt Isa Inlier, ~65km north-west of Cloncurry in north-west Queensland, Australia.

## OREAS-354 Zinc Concentrate

### Results

**Table: ColdBlock™ Digestion CB12L (%)**

Recoveries of Large Sample Size (0.25g) OREAS-354

Elements	Expected Value	ColdBlock Value 1	ColdBlock Value 2	Average ColdBlock Values	% RSD	% Recovery
Zn wt. %	49.3	49.0	49.7	<b>49.4</b>	0.7%	<b>100%</b>
Pb wt. %	1.58	1.61	1.63	<b>1.62</b>	0.6%	<b>103%</b>
S wt. %	26.63	26.03	26.67	<b>26.35</b>	1.2%	<b>99%</b>
Cd ppm	1157	1116	1139	<b>1127.5</b>	1.0%	<b>97%</b>
Cu ppm	1387	1242	1278	<b>1260</b>	1.4%	<b>91%</b>
Fe wt. %	9.82	9.41	9.49	<b>9.45</b>	0.4%	<b>96%</b>
Mg ppm	540	488	516	<b>502.0</b>	2.8%	<b>93%</b>
Mn wt. %	1.54	1.48	1.49	<b>1.485</b>	0.3%	<b>96%</b>
Ag ppm	98	89	87	<b>88</b>	1.1%	<b>90%</b>