

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°C
2. 0.25g of OREAS-354 was weighed and placed into a ColdBlock digestion vessel
3. 20mL of Reverse Aqua Regia was added (HNO₃ is added first, followed by the HCl)
4. Sample was digested at 80% power for 20 minutes
5. Sample was cooled and bulked to 50mL using 2% HNO₃_{v/v}

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.

DISCUSSION

- Upon addition of HNO₃, the evolution of reddish brown (NO₂) fumes occurred
- 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 HF.
- For improved silver recoveries bulk up using a solution of >20% HCl_{v/v}

OREAS-354

Zinc Concentrate

Results

Table: Results of Reverse Aqua Regia Digestion

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