

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

Published: by Lorie-Anne Doig, Aug. 2022

Digestion Time: 20 Minutes

Acid Used: Inverse 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 Inverse 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

DISCUSSION

- Upon addition of HNO₃, the evolution of reddish brown (NO₂) fumes occurred
- The evolution of NO₂ 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 total digestion to improve recoveries of certain elements
- For improved silver recoveries bulk up using a solution of 10-20% HCl v/v



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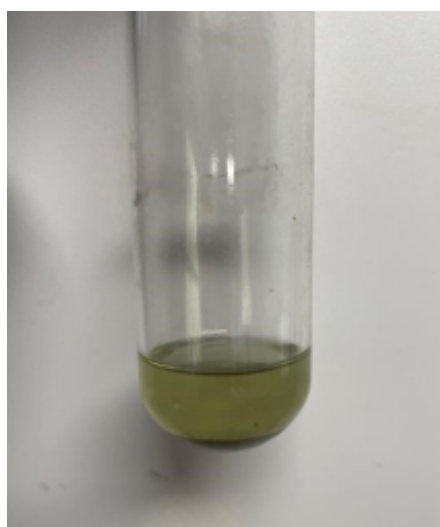
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RESULTS

Table 2: ColdBlock™ Digestion CB12L (%)
Recoveries of Large Sample Size (0.25g) OREAS-354

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



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.