

APPLICATION NOTE

GBM909-15 – Ore Grade Base Metal

SUMMARY

The application note summarizes the digestion of GBM909-15, an ore grade base metal Certified Reference Material using ColdBlock™ Digestion Pro Series Technology.

Instrument:	ColdBlock CBM sample digester, chiller, HF compatible liners, ICP-MS & ICP-OES
Published:	January 2023
Digestion Time:	30 Minutes
Acid Used:	Reverse Aqua Regia, HF & H ₃ BO ₃
Average ColdBlock Recovery vs. CRM:	<ul style="list-style-type: none">■ 94% Silver■ 98% Copper■ 102% Nickel

METHODOLOGY

1. Chiller temperature was set to -5 °C
2. 0.25g of each sample was weighed and placed into a ColdBlock™ Digestion vessel
3. 20 mL of reverse Aqua Regia + 3 mL HF
4. Sample was digested at 80% power for 20 minutes
5. 20mL of 4%_{v/v} Boric acid was added
6. Samples were digested again at 80% power for 10 minutes
7. Samples were cooled and bulked to 50mL using 2% HNO₃ + 0.5% HCl_{v/v}

DISCUSSION

- The addition of Boric acid will help re-solubilize any insoluble fluorides and will help neutralize any remaining HF in solution
- If Silver precipitates out of solution as AgCl, bulk up with >20% HCl_{v/v}
- If the Sulfide content of your sample is > 10 wt.% - reverse the ratios of Aqua Regia and use 1:3, HCl:HNO₃ - always add the Nitric acid first (reddish brown NO₂ fumes might form)



This material is described as a Nickel Sulphide Concentrate.
geostats.com.au

GBM909-15; Ore Grade Base Metal; Geostats Pty Ltd; Mining Industry Consultants; O'Connor, Western Australia (April, 2011)

GBM909-15 - Ore Grade Base Metal

Results

Geostats GBM909-15 - Nickel Sulphide Concentrate										
Method:	0.25g	20mL reverse Aqua Regia + 3 mL HF digested at 80% for 20 minutes, add 20mL of 4% Boric Acid - and digest again at 80% for another 10 minutes								
Element	Geostats Certified 4-acid Value (ppm)	95% Confidence Limits		Sample A	Sample B	Sample C	Average (ppm)	Stdev	% RSD	% Recovery vs certified 4-acid value
		Low	High							
Ag	13.5	13.26	13.74	12.9	12.9	12.3	12.7	0.28	2.2%	94%
Cu	13120	13052	13188	13055	13061	12347	12821	335.05	2.6%	98%
Pb	2120	2098	2142	2194	2217	2094	2168	53.39	2.5%	102%
Ni	115901	114922	116880	116943	120506	116606	118018	1764.42	1.5%	102%
Zn	26608	26399	26817	26204	27080	26389	26558	376.89	1.4%	100%