ColdBlock™ Technologies Inc.

APPLICATION NOTE

OREAS-78 Nickel-Cobalt-Sulfide

SUMMARY

This application note is for the digestion of OREAS-78, a Nickel-Cobalt Sulfide.

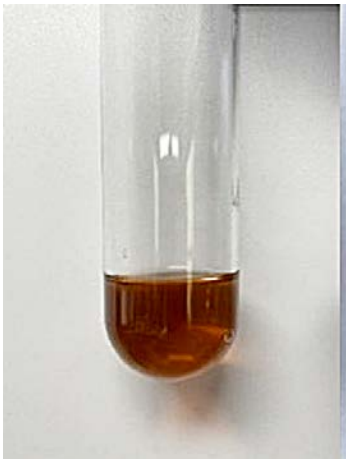
Instrument:	ColdBlock CBM Pro Series, chiller, ICP-OES
Published:	April 2025
Digestion Time:	20 Minutes
Acid Used:	Reverse Aqua Regia
Average ColdBlock Recovery vs. CRM:	■ 100% Nickel ■ 98% Cobalt ■ 94% Sulfur

METHODOLOGY

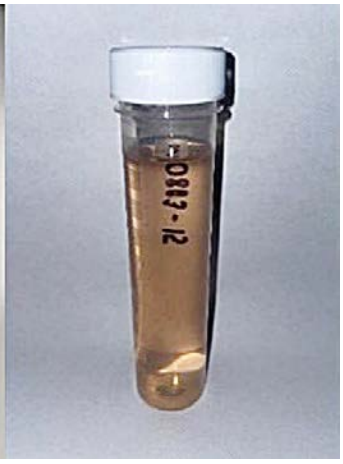
1. Chiller temperature was set to -5°C
2. 0.25g of OREAS-78 was weighed and placed into a ColdBlock digestion vessel
3, 20mL of reverse aqua regia was added (HNO_3 is added first, followed by the HCl)
4. Sample was digested at 80% power for 20 minutes
5. Sample was cooled and bulked to 50mL using 2% $HNO_{3\ v/v}$

DISCUSSION

- Upon addition of HNO_3, the evolution of reddish brown (NO_2) fumes occurred
- After 20 minutes, the samples were mostly clear
- After bulking up, the samples turned slightly pink, and a trace amount of material settled on the bottom of the tube
- Hydrofluoric acid can be added for a "near-total" digestion



OREAS 78 after digestion completed



OREAS 78 after bulk up with 2% HNO_3

OREAS 78 is a nickel-cobalt sulphide certified reference material (CRM) prepared from a nickel matte byproduct during the refining process at a nickel refinery.

Results

OREAS 78, Nickel-Cobalt Sulfide										
Method:	0.25g – Add 15mL HNO_3, and 5mL HCl and digest at 70% power for 20 minutes. Let cool, and bulk to 50mL									
Element	Certified Value	ColdBlock k Value 1	ColdBlock Value 2	ColdBlock Value 3	ColdBlock Value 4	ColdBlock Value 5	ColdBlock Average	Stdev	% RSD	% Recovery vs Certified
Ni (wt.%)	25.79	25.52	26.06	25.22	25.99	25.73	25.79	0.35	1.3%	100%
Co (wt.%)	23.74	22.90	23.41	22.81	23.62	23.20	23.16	0.34	1.5%	98%
S (wt.%)	28.61	26.24	27.50	27.29	27.76	27.02	26.87	0.58	2.2%	94%

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info@coldblock.ca
coldblock.ca/contact-us