APPLICATION NOTE

OREAS-78

NICKEL-COBALT-SULFIDE

ColdBlock™ Technologies Inc.

SUMMARY

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

Instrument: ColdBlock CB12 sample digester technology, chiller, ICP-OES

Published: by Lorie-Anne Doig, Aug. 2022

Digestion Time: 20 Minutes

Acid Used: 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 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 (N02) fumes occurred
- The evolution of NO2 fumes subsided near completion of the digestion, and the fumes turned white
- After 20 minutes, the samples are 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 total digestion

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

linkedin.com/company/coldblock-technologies

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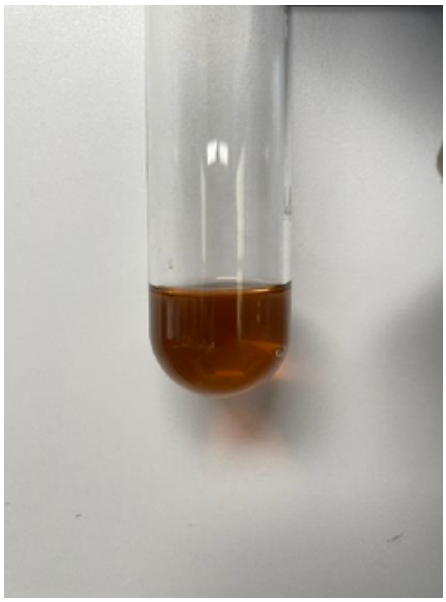
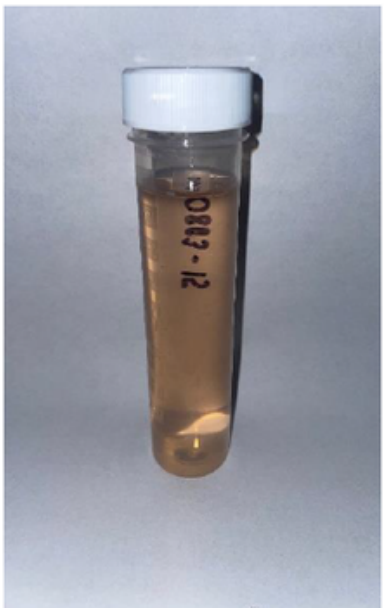
RESULTS

Table 2: ColdBlockTM Digestion CB12L (%)
Recoveries of Large Sample Size (0.25g) OREAS-78

Elements	Nickel (wt.%)	Cobalt (wt.%)	Sulfur (wt.%)
Expected CRM Value	25.79	23.74	28.61
ColdBlock Value 1	25.52	22.9	26.24
ColdBlock Value 2	26.06	23.41	27.5
ColdBlock Value 3	25.22	22.81	27.29
ColdBlock Value 4	25.99	23.62	27.76
ColdBlock Value 5	25.73	23.2	27.02
Average ColdBlock Values	25.79	23.16	26.87
% Recovery	100%	98%	94%
RSD	1%	1%	2%



OREAS 78 after bulk up with 2% HNO3



OREAS 78 after digestion completed

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