ColdBlock™ Technologies Inc

APPLICATION NOTE

OREAS 504b- Porphyry Copper-Gold

SUMMARY

The application note summarizes the aqua regia digestion of OREAS 504b, a porphyry copper-gold ore certified reference material using ColdBlock™ Digestion Pro Series Technology.

Instrument:	ColdBlock CBM sample digester, chiller, ICP-OES (Au by ICP-MS)
Published:	July 2026
Digestion Time:	20 minutes
Acid Used:	HNO_3, HCl
Average ColdBlock Recovery vs. CRM:	• 97% Gold • 101% Copper

METHODOLOGY

1. The chiller temperature was set to -5 °C.
2. Approximately 0.5 g of each sample was accurately weighed and transferred into a ColdBlock digestion vessel.
3. 20 mL of aqua regia (HCl:HNO_3, 3:1 $_{v/v}$) was added to each vessel.
4. Samples were digested at 70 % power for 1200 seconds (20 minutes).
5. Digestates were allowed to cool, then quantitatively diluted to a final volume of 50 mL using ultrapure Type 1 water.

DISCUSSION

- Gold was measured by an Agilent 7850 ICP-MS using helium collision cell mode
- Across the 23 quantified elements, ColdBlock aqua regia digestion of OREAS 504b produced average recoveries (n = 16) ranging from 95% (Li, Zr) to 111% (Ni) relative to the certified values, with 22 of 23 elements recovering within ±10% of the certified value.
- Precision was strong throughout, with %RSD at or below 4.7% for every element.
- Copper and gold - the primary analytes of interest for this porphyry copper-gold matrix - recovered at 101% and 97%, respectively, confirming that ColdBlock aqua regia digestion delivers accurate and precise recovery of these elements from this ore type.

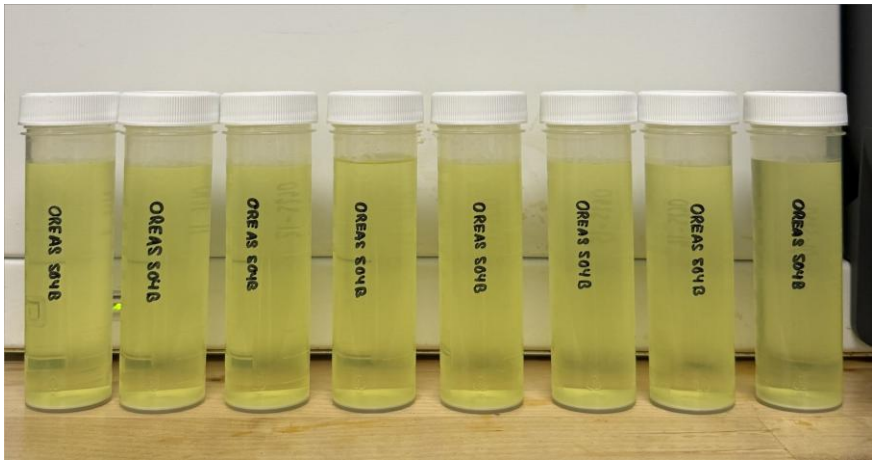

Figure 1. OREAS 504b digestates following ColdBlock aqua regia digestion, prior to ICP/ICP-MS analysis.

RESULTS

ColdBlock recoveries (n = 16) relative to the OREAS 504b certified values are summarized below.

Element	Certified Value (mg/kg)	ColdBlock Average, n=16 (mg/kg)	% Recovery	% RSD
Au	1.61	1.56	97%	3.7%
Al	19300	19100	99%	1.2%
Ba	166	176	106%	1.4%
Ca	16400	17500	107%	3.0%
Co	18.7	20.2	108%	3.6%
Cr	67	71	105%	2.0%
Cu	11000	11000	101%	2.2%
Fe	67100	71000	106%	1.7%
K	5500	5700	103%	3.7%
Li	21.7	20.7	95%	2.1%
Mg	13000	13000	101%	1.6%
Mn	406	445	110%	2.7%
Mo	476	511	107%	3.1%
Na	1830	1830	100%	4.0%
Ni	30	33	111%	2.4%
P	920	900	98%	3.1%
Pb	20.1	21.3	106%	4.6%
S	13100	13000	99%	1.4%
Sr	110	110	102%	1.7%
Ti	2200	2200	101%	1.6%
V	128	140	109%	1.6%
Zn	96	107	111%	4.7%
Zr	14.2	13.4	95%	3.2%

OREAS. OREAS 504b, Porphyry Copper-Gold-Molybdenum Reference Material, Certificate of Analysis COA-1008-OREAS 504b_2, revised June 14, 2018. OREAS, Ore Research & Exploration Pty Ltd. *(www.oreas.com).*