ColdBlock™ Technologies Inc.

APPLICATION NOTE

OREAS 750 – Pegmatite, Lithium Ore

SUMMARY

The application note summarizes the digestion of OREAS 750, a Pegmatite Certified Reference Material using ColdBlock™ Digestion Pro Series Technology.

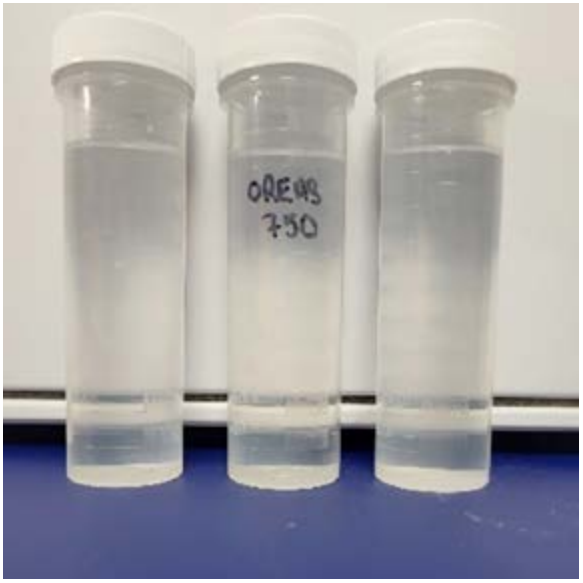
Instrument:	ColdBlock CBM sample digester, chiller, HF compatible liners, ICP-MS & ICP-OES
Published:	January 2023
Digestion Time:	30 Minutes
Acid Used:	Aqua Regia, HF & H_3BO_3
Average ColdBlock Recovery vs. CRM:	■ 99% Lithium ■ 110% Caesium ■ 114% Tantalum

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 Aqua Regia + 4 mL HF was added
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% HNO_3 + 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
- Samples appeared mostly clear at the end of the digestion; a minor amount of material settled on the bottom of the tube after bulk up



OREAS 750

This material was prepared from a blend of RC drill chip supplied from Core Lithium's Finniss Lithium project in Northern Territory, Australia.

OREAS 750; Pegmatite, Lithium Ore; Ore Research & Exploration; Melbourne, Australia (July,2020)

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Results

OREA 750											
Method:	0.25g	20mL Aqua Regia + 4mL HF, 80% 20 minutes - add 20mL 4% $_{w/v}$ Boric acid, 80% 10 minutes									
Element	Certified Value (ppm)	+/-	95% Confidence Limits		Sample A	Sample B	Sample C	Average (ppm)	Stdev	% RSD	% Recovery
			Low	High							
Ag	0.117	N/A	N/A	N/A	0.121	0.123	0.09	0.111	0.0	16.62%	95%
Al	54200	2700	51500	56900	55810	54485	53989	54761	941.4	1.72%	101%
As	13.3	0.6	12.7	14	12.8	13.7	12.5	13.0	0.6	4.79%	98%
Ba	432	22	410	453	437	432	446	438	7.4	1.68%	101%
Be	37.6	1.9	35.7	39.5	36.0	36.3	38.2	36.9	1.2	3.29%	98%
Bi	1	0.05	0.95	1.05	1.12	1.11	1.02	1	0.1	5.08%	108%
Ca	8280	410	7870	8700	8401	8370	8281	8351	62.5	0.75%	101%
Cd	0.58	0.03	0.55	0.61	0.59	0.59	0.6	0.59	0.01	0.97%	102%
Ce	33.2	1.7	31.5	34.9	26.6	26.6	28.5	27.2	1.1	4.15%	82%
Co	3.99	0.2	3.79	4.18	4.21	4.07	3.94	4.07	0.1	3.31%	102%
Cr	27.6	1.4	26.2	29	32.4	32.6	33.0	32.7	0.3	0.94%	118%
Cs	22.6	1.1	21.5	23.7	24.98	24.35	25.35	24.9	0.5	2.03%	110%
Cu	20.4	1.1	19.3	21.4	22.7	21.8	20.8	21.8	0.9	4.32%	107%
Fe	16700	800	15900	17500	16906	16826	16888	16874	41.9	0.25%	101%
Ga	13	0.7	12.3	13.6	N/A	14	13	13	0.4	3.17%	103%
Hf	1.34	0.07	1.27	1.41	1.29	1.26	1.29	1.28	0.02	1.35%	96%
K	16900	800	16100	17800	17250	17268	17081	17200	103.3	0.60%	102%
La	15.7	0.8	14.9	16.5	12.7	13.1	13.3	13.0	0.3	2.29%	83%
Li	2320	120	2200	2430	2300	2292	2307	2300	7.6	0.33%	99%
Mg	3150		0.299	0.331	3433	3355	3306	3365	64.3	1.91%	107%
Mn	380	10	370	400	384	378	378	380	3.2	0.83%	100%
Mo	2.17	0.11	2.06	2.28	2.42	2.09	2.04	2.18	0.2	9.46%	101%
Na	15300	800	14500	16100	16381	15830	15486	15899	451.1	2.84%	104%
Nb	21.3	1.1	20.2	22.4	21.04	20.91	20.5	20.8	0.3	1.35%	98%
Ni	11.4	0.6	10.8	12	13.26	12.55	12.18	12.7	0.5	4.33%	111%
P	700	40	660	730	689	648	588	642	50.6	7.89%	92%
Pb	13.8	0.7	13.1	14.5	14.7	13.9	14.6	14.4	0.4	3.03%	104%
Rb	254	12	242	267	267	262	258	262	4.6	1.74%	103%
**Si	368700	N/A	N/A	N/A	356104	338370	345435	346636	8927.8	2.58%	94%
Sb	0.42	0.02	0.4	0.44	<0.5	<0.5	<0.5	N/A	N/A	N/A	N/A
Sn	25.2	1.2	24	26.5	27.51	23.30	24.89	25.2	2.1	8.42%	100%

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Element	Certified Value (ppm)	+/-	95% Confidence Limits		Sample A	Sample B	Sample C	Average (ppm)	Stdev	% RSD	% Recovery
			Low	High							
Sr	74	4	70	78	77.57	76.33	75.21	76	1.2	1.55%	103%
Ta	9.78	0.49	9.29	10.27	11.78	10.78	10.92	11.16	0.5	4.85%	114%
Th	6.71	0.34	6.37	7.05	6.57	6.44	6.51	6.51	0.1	1.00%	97%
Ti	1580	80	1500	1660	1565	1486	1515	1522	40.1	2.64%	96%
Tl	1.45	0.07	1.38	1.52	1.78	1.82	1.81	1.80	0.02	1.15%	124%
U	4.24	0.21	4.03	4.45	4.33	4.31	4.34	4.33	0.02	0.35%	102%
V	26.4	1.3	25.1	27.7	25.8	25.4	24.8	25.4	0.5	1.98%	96%
W	5.46	0.28	5.18	5.73	5.72	5.49	5.27	5.49	0.2	4.10%	101%
Y	7.26	0.37	6.89	7.62	6.87	6.23	6.71	6.60	0.3	5.04%	91%
Zn	65	4	61	68	65.64	65.11	63.89	65	0.9	1.38%	100%
Zr	31.3	1.6	29.7	32.9	32.73	31.63	30.86	31.7	0.9	2.96%	101%

**Represents elements certified by Peroxide Fusion (no 4-acid data available)

ColdBlock™ Technologies Inc.

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