

Qotho CRM-1-220 - Ferrochrome

SUMMARY

The application note summarizes the digestion of QCRM-1-220 a Ferrochrome Certified Reference Material using ColdBlock™ Digestion Pro Series Technology.

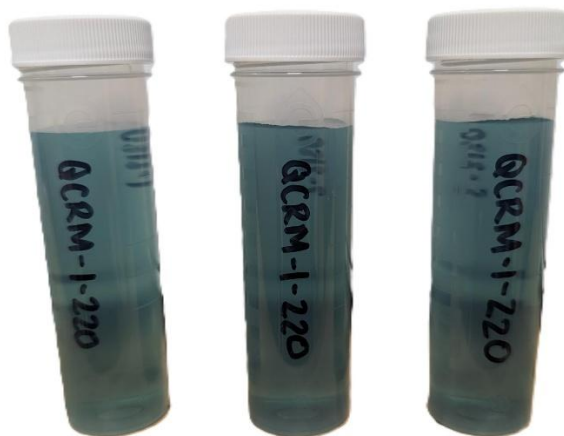
Instrument:	ColdBlock CBM sample digester, chiller, HF inserts, ICP-OES
Published:	March 2026
Digestion Time:	95.5 minutes
Acid Used:	H ₂ SO ₄ , HNO ₃ , HF
Average ColdBlock Recovery vs. CRM:	<ul style="list-style-type: none"> • 100% Chromium • 99% Iron • 100% Manganese

METHODOLOGY

1. The chiller temperature was set to -5 °C.
2. Approximately 0.100 g of each sample was accurately weighed and transferred into a ColdBlock digestion vessel.
3. A reagent mixture of 20 mL 5 % H₂SO₄ v/v and 2 mL HF was added to each vessel.
4. Samples were digested at 100 % power for 5 minutes, followed by 50% power for 80 minutes.
5. An additional 5 mL HNO₃ was introduced to each vessel.
6. Samples were further digested at 40 % power for 10 minutes, followed by 100 % power for 30 seconds.
7. Digestates were allowed to cool, then quantitatively diluted to a final volume of 50mL using a solution of 2 % HNO₃ v/v.

DISCUSSION

- An optional addition of boric acid (20mL of 4% v/v H₃BO₃) can be used to complex residual fluoride ions, which stabilizes the solution and enables safe analysis on sample introduction systems that are not equipped with inert HF kits.



RESULTS

QCRM-1-220 - Ferrochrome Powder									
Element	Certified Value (wt.%)	+/-	Sample A	Sample B	Sample C	Average (wt.%)	Stdev	RSD	Recovery
Al	0.08	0.01	0.08	0.09	0.09	0.09	0.003	3.1%	107%
Co	0.055	0.002	0.060	0.056	0.057	0.057	0.002	3.4%	104%
Cr	53.56	0.11	52.92	53.78	54.67	53.79	0.87	1.6%	100%
Fe	35.8	0.37	34.8	35.3	35.8	35.3	0.51	1.5%	99%
Mn	0.29	0.01	0.28	0.29	0.29	0.29	0.004	1.5%	100%
Ni	0.15	0.01	0.15	0.15	0.15	0.15	0.003	2.0%	101%
Si	0.29	0.05	0.33	0.32	0.31	0.32	0.01	3.1%	110%
Ti	0.14	0.01	0.13	0.14	0.14	0.14	0.003	2.1%	97%
V	0.34	0.01	0.33	0.33	0.34	0.33	0.01	3.0%	98%

Qotho Minerals (Pty) Ltd (2022). QCRM-1-220 Ferrochrome Certified Reference Material, Certificate of Analysis. South Africa.