

	Geochemistry Lakefield	Doc Type Method Summary Method Code GC_ICP91AC1 Service Testing Issued Date September 2024
Natural Resources	Multi-Element Determination in Control Grade Samples by Sodium Peroxide Fusion and Inductively Coupled Plasma Optical Emission Spectrometry [Na ₂ O ₂ ; ICP-OES]	Approved by S. Meyers

1. Parameter(s) measured, unit(s):

Aluminum (Al), Arsenic (As), Boron (B), Barium (Ba), Beryllium (Be), Bismuth (Bi), Calcium (Ca), Cadmium (Cd), Cobalt (Co), Chromium (Cr), Copper (Cu), Iron (Fe), Potassium (K), Lithium (Li), Magnesium (Mg), Manganese (Mn), Molybdenum (Mo), Nickel (Ni), Phosphorus (P), Lead (Pb), Sulfur (S), Antimony (Sb), Scandium (Sc), Selenium (Se), Silica (Si), Tin (Sn), Strontium (Sr), Titanium (Ti), Thallium (Tl), Vanadium (V), Tungsten (W), Yttrium (Y), Zinc (Zn), Zirconium (Zr); in mg/Kg

2. Typical sample size:

0.1 g

3. Type of sample applicable (media):

Ores, concentrates and metallurgical test products

4. Sample preparation technique used:

Representative pulverized sample is fused in a glassy carbon crucible at 500°C with sodium peroxide (Na₂O₂) to oxidize potentially insoluble compounds to an oxide form. The resultant cake is dissolved in HNO₃.

5. Method of analysis used:

The digested sample solution is analyzed by inductively coupled plasma Optical Emission Spectrometer (ICP-OES).

6. Data reduction by:

Computer, on line, data fed to SGS Laboratory Information Management System with secure audit trail.

7. Figures of Merit:

This method has been fully validated for the range of samples typically analyzed. Method validation includes the use of reference materials, replicates, duplicates and blanks to calculate accuracy, precision, linearity, range, limit of detection, reporting limit, specificity and measurement uncertainty.

The Reporting Limit has been determined according to the following:

Element	Report Limit (mg/Kg)	Element	Report Limit (mg/Kg)	Element	Report Limit (mg/Kg)
Al	100	K	1000	Si	1000
As	30	Li	10	Sn	50
B	20	Mg	100	Sr	10
Ba	10	Mn	10	Ti	100
Be	5	Mo	10	Tl	100
Bi	20	Ni	20	V	10
Ca	1000	P	100	W	50
Cd	10	Pb	20	Y	5
Co	10	S	200	Zn	10
Cr	10	Sb	50	Zr	100
Cu	10	Sc	5		
Fe	100	Se	50		

8. Quality control:

Quality control materials include method blanks, replicates and reference materials and are randomly inserted with the frequency set according to method protocols at ~12%. Quality control materials will also include BRM (Barren reference materials, or preparations blanks) and preparation duplicates if samples have been taken through the sample reduction process. Instrument calibration is performed for each batch or work order and calibration checks are analyzed within each analytical run.

9. Accreditation:

SGS Natural Resources conforms to the requirements of ISO/IEC 17025. Scopes of Accredited tests are site specific, please visit [Accredited Organizations | Standards Council of Canada \(scc-ccn.ca\)](https://www.sgs.ca/en/mining/scc-ccn.ca)