	Geochemistry Global	Doc Type Method Code Service Issued Date	Method Summary GO_ICP95A50 Testing April 2022
	Natural Resources	Multi-element Determination in Exploration and Ore Samples using Lithium Metaborate Fusion and Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES)	Approved by K. Williams

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

Aluminum oxide (Al₂O₃); Calcium oxide (CaO); Chromium oxide (Cr₂O₃); Iron oxide (Fe₂O₃); Magnesium oxide (MgO); Manganese oxide (MnO); Phosphorus oxide (P₂O₅); Potassium oxide (K₂O); Silica (SiO₂); Sodium oxide (Na₂O); Titanium oxide (TiO₂): Barium (Ba); Niobium (Nb); Strontium (Sr); Yttrium (Y); Zinc (Zn); Zirconium (Zr); LOI: %

2. Typical sample size:

0.10 g

3. Type of sample applicable (media):

Crushed and Pulverized rocks, soils and sediments

4. Sample preparation technique used:

Crushed and pulverized rock, soil and /or sediment samples are fused by Lithium metaborate and dissolved using dilute HNO₃.

5. Method of analysis used:

The digested sample solution is analyzed by Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES). Samples are analyzed against known calibration materials to provide quantitative analysis of the original sample.

6. Data reduction by:

The results are exported via computer, on line, data fed to the SGS Laboratory Information Management System (SLIM) 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 certified 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 as follows:

Element	Reporting Limit (%)	Upper Limit	Element	Reporting Limit (%)	Upper Limit
Al ₂ O ₃	0.01 %	75%	TiO ₂	0.01%	25%
CaO	0.01%	60%	V ₂ O ₅	0.01%	10%
Cr ₂ O ₃	0.01%	10%	Ba*	0.001	10%
Fe ₂ O ₃	0.01%	75%	Nb*	0.001	10%
K ₂ O	0.01%	25%	Sr*	0.001	10%
MgO	0.01%	30%	Sc*	5 (mg/kg)	50000 (mg/kg)
MnO	0.01%	10%	Y*	0.001	10%
Na ₂ O	0.01%	30%	Zn*	5 (mg/kg)	10000 (mg/kg)
P ₂ O ₅	0.01%	25%	Zr*	0.001	10%
SiO ₂	0.01%	90%	*Can be added upon request		

*

	Geochemistry Global	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Doc Type</td> <td style="width: 50%;">Method Summary</td> </tr> <tr> <td>Method Code</td> <td>GO_ICP95A50</td> </tr> <tr> <td>Service</td> <td>Testing</td> </tr> <tr> <td>Issued Date</td> <td>April 2022</td> </tr> <tr> <td>Approved by</td> <td>K. Williams</td> </tr> </table>	Doc Type	Method Summary	Method Code	GO_ICP95A50	Service	Testing	Issued Date	April 2022	Approved by	K. Williams
Doc Type	Method Summary											
Method Code	GO_ICP95A50											
Service	Testing											
Issued Date	April 2022											
Approved by	K. Williams											
Natural Resources	Multi-element Determination in Exploration and Ore Samples using Lithium Metaborate Fusion and Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES)											

8. Quality control:

Quality control materials include method blanks, duplicates and reference materials and are randomly inserted with the frequency set according to method protocols at ~11% for ore grade analysis. Quality control materials will also include preparations blanks and replicates 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 <https://www.scc.ca/en/search/laboratories>