SGS	**Geochemistry** **Lakefield Laboratory**	Doc Type: **Method Summary** Method Code: **GC_IMS93A** Service: **Testing** Issued Date: **September 2021** Approved by: **S. Meyers**
Natural Resources	**Preparation and Determination of Elements in Concentrates and Process Control Products by Sodium Peroxide Fusion and Inductively Coupled Plasma - Mass Spectrometry** [ICP-MS]	

1. **Parameter(s) measured, unit(s):**
   Cerium (Ce), Dysprosium (Dy), Erbium (Er), Europium (Eu), Gadolinium (Gd), Holmium (Ho), Lanthanum (La), Lutetium (Lu), Neodymium (Nd), Praseodymium (Pr), Samarium (Sm), Terbium (Tb), Thorium (Th), Thulium (Tm), Uranium (U), Ytterbium (Yb) in g/t
   Silver (Ag), Arsenic (As), Barium (Ba), Bismuth (Bi), Cadmium (Cd), Cobalt (Co), Chromium (Cr), Cesium (Cs), Copper (Cu), Gallium (Ga), Germanium (Ge), Hafnium (Hf), Indium (In), Lithium (Li), Molybdenum (Mo), Niobium (Nb), Nickel (Ni), Lead (Pb), Rubidium (Rb), Antimony (Sb), Selenium (Se), Tin (Sn), Strontium (Sr), Tantalum (Ta), Tellurium (Te), Thallium (Tl), Vanadium (V), Tungsten (W), Zinc (Zn), in g/t may be requested as additional.

2. **Typical sample size:**
   0.1 g

3. **Type of sample applicable (media):**
   Ores, metallurgical products and geological samples

4. **Sample preparation technique used:**
   0.1g of sample is mixed with sodium peroxide in a zirconium crucible. The sodium peroxide and sample are fused until they form a homogenous melt. The fusion melt is then cooled and re-dissolved in dilute hydrochloric acid. The fused and re-dissolved sample is now ready for analysis.

5. **Method of analysis used:**
   The digested samples are diluted to reduce matrix interference and analyzed by Inductively Coupled Plasma Mass Spectroscopy (ICP-MS)

6. **Data reduction by:**
   Computer, on line, data fed to the Laboratory Information Management System with secure audit trail.

7. **Figures of Merit:**

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

The Reporting Limit has been determined according to the following:

Element	Ce	Dy	Er	Eu	Gd	Ho	La	Lu	Nd	Pr	Sm	Tb	Th	Tm	U	Yb
RL (g/t)	3	0.5	0.5	0.3	0.5	0.3	3	0.5	5	0.5	0.5	0.5	0.5	0.3	0.5	0.5

Element	Ag	As	Ba	Bi	Cd	Co	Cr	Cs	Cu	Ga	Ge	Hf	In	Li	Mo	Nb
RL (g/t)	30	200	20	8	200	8	50	10	20	5	10	10	3	100	10	40

Element	Ni	Pb	Rb	Sb	Se	Sn	Sr	Ta	Te	Tl	V	W	Zn
RL (g/t)	30	10	10	10	200	30	20	10	10	5	30	10	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 ~18% for process control. 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 https://www.scc.ca/en/search/laboratories