ICP-OES and unique mineral and elemental separation capabilities at the Dalhousie University, Cosmogenic Isotope Lab, Halifax, Nova Scotia, Canada

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The goals of the Cosmogenic Isotope Lab are to: (1) train students and visitors in isotope geochemistry, cosmogenic nuclide exposure geochronology, and related analytical methods; (2) provide geochronology and erosion rate results; (3) improve geochronology methods; and (4) complete other fee for service work. The cosmogenic isotope lab prepares ^{10}Be, ^{26}Al, ^{36}Cl targets using combinations of ion chromatography (different volumes and types of anion and cation exchange resins) and pH-controlled precipitations, and soon ^{14}C from quartz, for analysis by accelerator mass spectrometry, with partner labs uOttawa, Lawrence Livermore National Laboratory, PRIME Lab, ETH-Zurich. A large range of mineral separation expertise and Inductively Coupled Plasma Optical Emissions Spectroscopy services are available.

Mineral separation includes physical processing such as cleaning, crushing, grinding, sieving, and routine methods using Wilfley table, frantz magnetic (all shared instruments), and heavy liquid separation. Unique to at least the Atlantic region are the following mineral separation strategies: (1) air abraders capable of 30 g aliquot mineral separation on the basis of mineral hardness; (2) froth flotation using lauryl amine surfactant and compressed CO_2 frothing to separate minerals with different surface electrostatic properties; (3) hexafluorosilicic acid and high-T pyrophosphoric acid methods to remove or digest aluminosilicates from quartz; and (4) selective digestion of silicates in 25-gallon ultrasonic tanks. The isotope lab has a Questron Vulcan automated digestion system which uses recessed heat blocks, syringes, and a combination of acids to digest, transfer, and dilute up to 25 ml samples to test tubes.

The Teledyne-Leeman Lab PRODIGY ICP-OES is capable of measuring a wide range of major, minor, and trace elements as low as 0.1 ug/ml. The ICP-OES can accept solutions containing hydrofluoric acid and is able to analyse halogens.

Atlantic Geology, 2017, Volume 53
Atlantic Geoscience Society Abstracts – 43rd Colloquium & Annual General Meeting 2017
doi: 10.4138/atlgeol.2017.006