ISOTOPE TRACER TECHNOLOGIES INC

^{87}Sr STRONTIUM ANALYSIS BY THERMAL IONIZATION MASS SPECTROMETRY

Sample Preparation:

Strontium concentration data for any submitted sample is crucial in order to decide the required sample weight or volume. Thermal Ionization Mass Spectroscopy (TIMS) can be used to analyze only a few micrograms of strontium (25 to 100 μg), and as little as 5 μg can be analyzed. Samples are first filtered through 0.2 μm filter into clean Teflon containers. Large volumes may be needed for low Sr concentration samples. Samples are pre-treated differently depending on sample type and composition. Sr separation is conducted with nitric acid and an ion-exchange procedure that utilizes a Sr-specific, pre-conditioned resin. Sr is then eluted with ultra-pure water and sample strontium is collected in PTFE containers, and dried. They are re-dissolved using 0.3M H_3PO_4 prior to analysis.

Sample Analysis:

Strontium isotopic analyses is carried out on a Triton Thermo Scientific Thermal Ionization Mass Spectrometer. Analysis is carried out using a double degassed rhenium filament technique. Filament holders with degassed and oxidized filaments are mounted on the loading device and placed inside a positive laminar flow air-chamber. The sample is loaded onto the filament using a micropipette. The samples are dried and mounted onto the Triton analysis magazine with filament shields. Calibrated internal standards are run at the beginning and end of every run, as well as after every 8-10 samples. These standards have been calibrated to NIST SRM 987. The results are evaluated and corrected against standards that bracket the samples, and then reported against the international reference material.

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