

High-Precision Sr-Nd-Hf-Pb Isotopic Composition of CGSG-1, CGSG-2, CGSG-4 and CGSG-5 Reference Materials by MC-ICP-MS and TIMS

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Glass reference materials play an important role in microanalysis, using techniques like EPMA, LA-(MC)-ICP-MS, and SIMS. They are usually used as known or unknown samples for external calibration, method development, quality control and inter-laboratory comparison. For example, NIST SRM glasses, the various USGS glass materials and MPI-DING are widely used as micro-analytical reference materials.

The widespread distribution and usage glass reference materials, not only because of their major and trace elements, but also their isotopic characterizations, make them significant reference materials for microanalysis. Because of widely distributed NIST, USGS and MPI-DING series glasses, there are also various publications focused on their isotopic compositions.

To assess the homogeneity and provide first Sr-Nd-Hf-Pb isotopic reference values of the Chinese Geological Standard Glasses CGSG-1, CGSG-2, CGSG-4 and CGSG-5, we analyzed the Sr-Nd-Hf-Pb isotopic compositions of CGSG glasses at several analytical sessions over the course of nearly three years. The results were obtained by high-precision MC-ICP-MS and TIMS. Our investigation indicates that these CGSG glass reference materials are homogenous regards to Sr-Nd-Hf-Pb isotopic distribution and are therefore suitable geochemical materials for Sr-Nd-Hf-Pb isotope measurements. Obvious difference of Sr-Nd-Hf-Pb isotopic composition was observed between the glasses and the original powdered rock reference materials (CGSG-2 and GSR-7, especially CGSG-5 and GSR-2) because of flux addition during the glass preparation. The new Sr-Nd-Hf-Pb isotope data provided here might be useful in the geochemical community for in situ and bulk analysis.