Calcium isotopic compositions of sixteen USGS reference materials

LAN-PING FENG[1], LIAN ZHOU[1*], SUN-YUN TONG[1], SHAN GAO[1]

[1] State Key Laboratory of Geological Processes and Mineral Resources, School of Earth Sciences, China University of Geosciences, Wuhan 430074, China

Ca isotopic compositions of sixteen Ca-bearing USGS geological reference materials including igneous and sedimentary rocks are reported. Ca isotopic compositions were determined in two laboratories (GPMR: State Key Laboratory of Geological Processes and Mineral Resources, China University of Geosciences, Wuhan and CIG: Center for Isotope Geochemistry, University of California, Berkeley) using ^{42}Ca-^{48}Ca double spike technique by thermal ionization mass spectrometry. As opposed to common cation exchange resin, a micro-column filled with Ca selective resin (DGA resin) was used to achieve high recovery (> 96%) and efficient separation of Ca from the sample matrix. The long-term reproducibility was evaluated at 0.14‰ (2*s*) for δ^{44}Ca at GPMR, based on replicate measurements of pure Ca reference material NIST SRM 915a, NIST SRM 915b and seawater. Overall, the measurement uncertainties in both laboratories were better than 0.15‰ at 2*s* level. Where comparison is available, the Ca isotopic compositions of USGS reference materials are not only in agreement between GPMR and CIG (Fig. 1) but also in agreement with previously published data within quoted uncertainties. The comprehensive dataset reported in this study serves as a reference for both quality assurance and inter-laboratory comparison of high precision Ca isotopic study.

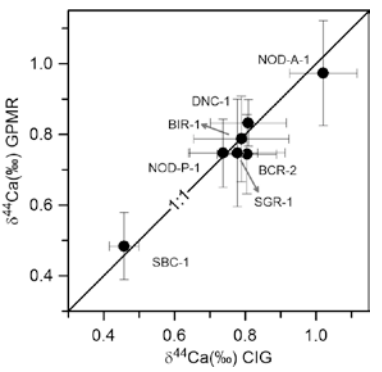

Fig. 1. Comparison of Ca isotopic compositions of USGS reference materials measured in CIG and GPMR. Error bars represent 2 standard deviations (2s) of each measurement.