An inter-laboratory calibration of Si isotope reference materials

B.C. REYNOLDS¹, J. AGGARWAL², M.A. BRZEZINSKI³, D. CARDINAL⁴, E. ENGSTRÖM⁵, R.B. GEORG¹, M. LAND⁶, M. LENG⁷, S. OPFERGELT⁴,⁸, AND P.Z. VROON⁹

¹IGMR, ETH Zürich, Switzerland; reynolds@erdw.ethz.ch and georg@erdw.ethz.ch
²Keck Isotope Laboratory, University of California, Santa Cruz, CA 95064 USA; jaggarwal@pmc.ucsc.edu
³Marine Science Institute, University of California, Santa Barbara, CA 93106 USA; brzezinski@lifesci.ucsb.edu
⁴Muse´e Royal de l’Afrique Centrale, Leuvensesteenweg 13, Tervuren, Belgium; damien.cardinal@africamuseum.be
⁵Div. of Applied Geology, Luleå University of Technology, S-971 87 Luleå, Sweden; emma.engstrom@analytica.se
⁶Dept of Geology and Geochemistry, Stockholm University, SE-106 91 Stockholm, Sweden; magnus.land@geo.su.se
⁷NERC Isotope Geosciences Laboratory, Keyworth, NG12 5GG, and School of Geography, University of Nottingham, NG7 2RD, UK; mj@nigl.nerc.ac.uk
⁸Soil Science Unit, Universite Catholique De Louvain, Louvain-La-Neuve, Belgium; opfergelt@sols.ucl.ac.be
⁹Dept. of Petrology, FALW, Vrije Universiteit, 1081 HV Amsterdam, The Netherlands; pieter.vroon@falw.vu.nl

Three Si isotope materials have been used for an interlaboratory calibration exercise to ensure reproducibility between international laboratories investigating natural Si isotope variations using a variety of chemical preparation methods and mass-spectrometric techniques. These proposed standard reference materials are (i) IRMM018, a SiO₂ standard, (ii) a fractionated SiO₂ material prepared at the University of California at Santa Barbara, and (iii) a natural diatomite sample (originally deposited as marine biogenic opal). The average δ²⁹Si values for Diatomite, IRMM018, and Big Batch are +0.65‰, −0.88‰, and −5.35‰, respectively. All laboratories reproduced these values to within ±0.1‰. A more detailed investigation of these data will be presented and discussed in order to investigate any systematic offsets between measurements or sample heterogeneity.

Fig. 1. Average measured Si isotope composition (in ‰ δ²⁹Si) for each laboratory, relative to NBS28 (SRM-8546).