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Absolute Calibration of Si iRMs used for Si Paleo-nutrient proxies

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The Avogadro Project is an ongoing international effort, coordinated by the International Bureau of Weights and Measures (BIPM) and the International Avogadro Coordination (IAC) to redefine the SI unit mole in terms of the Avogadro constant and the SI unit kg in terms of the Planck constant. One of the outgrowths of this effort has been the development of a novel, precise and highly accurate method to measure calibrated (absolute) isotopic ratios that are traceable to the SI (Vocke et al., 2014 Metrologia 51, 361, Azuma et al., 2015 Metrologia 52 360). This approach has also been able to produce absolute Si isotope ratio data with lower levels of uncertainty when compared to the traditional "Atomic Weights" method of absolute isotope ratio measurement.

Silicon isotope variations (reported as delta(Si30)and delta(Si29)) in silicic acid dissolved in ocean waters, in biogenic silica and in diatoms are extremely informative paleo-nutrient proxies. The utility and comparability of such measurements however depends on calibration with artifact isotopic Reference Materials (iRMs). We will be reporting new measurements on the iRMs NBS-28 (RM 8546 - Silica Sand), Diatomite, Big Batch and SRM 990 using the Avogadro measurement approach, comparing them with prior assessments of these iRMs.