

Mass Dependent Strontium Isotopic Fractionation

J.K. AGGARWAL

W.M. Keck Isotope Laboratory, Dept of Earth Sciences,
University of California, Santa Cruz, CA 95064, USA;
(jaggarwal@es.ucsc.edu)

Strontium (Sr) isotopes have been used for over 40 years to examine geological processes, e.g. age of rocks or provenance. More recently they have been applied to biological samples to examine animal migration and nutrition. These latter applications assume that Sr isotopes are not fractionated in these biological and low temperature systems. In the measurement of Sr isotopic composition the $^{87}\text{Sr}/^{86}\text{Sr}$ is measured relative to the $^{86}\text{Sr}/^{88}\text{Sr}$ assuming that the $^{86}\text{Sr}/^{88}\text{Sr}$ is invariant in nature. Instrumental mass bias is corrected for by normalizing to $^{86}\text{Sr}/^{88}\text{Sr}$ thereby eliminating any scope for examining mass dependent fractionation of Sr. By double-spiking samples with ^{84}Sr and ^{88}Sr , it is possible to measure the mass dependent fractionation of Sr.

A suite of samples has been selected for this study because they show a wide range of Ca isotope values. These samples include seawater, egg shell and egg white, Antarctic soil, and marine mammal bone since they show the highest potential for Sr isotopic fractionation.

Data will be presented showing $\delta^{44}\text{Ca}$ and $\delta^{88}\text{Sr}$ for this suite of sample showing that it is possible to predict the mass dependent Sr isotopic fractionation based on Ca isotopes.