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Cadmium Stable Isotope Measurements by MC-ICPMS

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Cadmium is a chalcophile and highly volatile element with eight stable isotopes spanning a mass difference of 8.6% and ten atomic mass units (amu) from ^{106}Cd to ^{116}Cd. So far, mass-dependent isotope fractionation of Cd has only been found in chondrites (e.g. Rosman and De Laeter 1976, 1988) but not in terrestrial materials. Further studies of Cd isotope compositions in terrestrial materials are needed to evaluate the extent of possible terrestrial Cd isotope variations and to understand the processes involved.

Despite the high first ionization potential of Cd (9.0 eV), TIMS has previously been used for the study of mass dependent Cd isotope fractionations in meteorites (e.g. Rosman and De Laeter 1976, 1988).We use the Micromass IsoProbe MC-ICPMS (multiple collector inductively coupled plasma mass spectrometer) combined with a Cetac MCN 6000 desolvation nebulizer. Stable isotope ratio measurements take advantage of the fact that the instrumental mass discrimination of plasma source mass spectrometers remains essentially constant for samples and standards as long as the operating conditions are not changed. The mass discrimination of plasma source instruments (about 2.7% per amu for Cd), however, is an order of magnitude larger than the mass fractionation associated with thermal ionization. Furthermore, drift in instrumental mass discrimination between sample and standard measurements can result in significant errors. In order to overcome drift problems, we apply the empirical method of external normalization of Maréchal et al. (1999), using admixed Ag.

Maréchal CN, Telouk P & Albarède F, *Chem. Geol.*, **156**, 251-273.

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