



ID de Contribution: 29

Type: Talk

The Cadmium isotope composition of Earth mantle and its origin

mercredi 27 mars 2024 16:15 (15 minutes)

Cadmium is a relative newcomer in stable isotopes geochemistry, although its utilization has gained some traction recently. This element, having one of the lowest 50 % condensation temperature of the moderately volatile elements ($T_{50} = 502\text{K}$), should be able to provide insights for the characterization of vaporization events. Moreover, it is siderophile and chalcophile, leading to a significant segregation in the core. Thus, study of the core formation could also probably benefit from Cd isotopic surveys.

We propose a new estimation for the isotope composition of the Earth mantle, based on the analysis of a set of mid-oceanic ridge basalts (MORB) and Archean lavas (komatiites). Komatiites were selected because they originate from melts caused by high melting rates, ensuring that no significant isotope fractionation occurs during melting. The most pristine komatiites gave up a $\delta^{114}\text{Cd} = 0.14 \pm 0.18 \text{‰}$ (2SD, $n = 5$) composition. Ridge basalts from the Atlantic, Indian and Pacific oceans were characterized by very homogeneous compositions, regardless of their locality. We obtained a mean isotope composition of $0.07 \pm 0.10 \text{‰}$ (2SD, $n = 23$). The fact that komatiites and MORB have similar isotope compositions indicate that such melting rates do not produce significant isotope fractionation. From these samples, we determine a bulk silicate Earth isotope composition of $0.11 \pm 0.10 \text{‰}$ (2SD, $n = 28$), which is significantly heavier than previously proposed compositions.

Auteur principal: DEVOS, gabriel (IPGP)

Orateur: DEVOS, gabriel (IPGP)

Classification de Session: Talks: PhD students session