

## Heterogeneous Magnesium Isotopic Compositions of Oceanic Basalts

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Magnesium is one of the major elements of the terrestrial mantle. Previous studies on mantle xenoliths and oceanic basalts suggested a homogeneous average  $\delta^{26}\text{Mg}$  value of  $-0.25\pm 0.07$  (2SD) for the Earth's mantle, and the partial melting or magma differentiation would not fractionate the Mg isotope significantly. Here we report new Mg isotopic data of basalts from the Hawaii islands and the Louisville seamounts, and re-evaluate the heterogeneity of Mg isotopes for oceanic basalts. The new data suggest that the Mg heterogeneity of OIBs is still limited, with an overall average  $\delta^{26}\text{Mg}$  value of  $-0.287\pm 0.032$  (2SD), but at least higher than that of MORBs. After re-examining published data, as well as our new data, Mg isotopes of most OIBs are well-correlated with those geochemical indices for melting degree, and alkaline basalts always have lighter Mg isotopic composition than tholeiites, suggesting low-degree melting might induce fractionation of Mg isotopes. However, The Louisville seems an exception, which has lighter Mg isotopes (average  $\delta^{26}\text{Mg}$  value of  $-0.321\pm 0.032\%$ , 2SD) for a given melting degree, indicating that not only melting degree but also source heterogeneity should be responsible for the Mg isotopic heterogeneity of oceanic basalts.

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