

**HIGHLIGHTS AND BREAKTHROUGHS**

**The deep continental crust has a larger Mg isotopic variation than previously thought**

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**Abstract:** Magnesium isotope compositions of the bulk continental crust is a key to understand Mg isotope behaviors during crustal processes, and is the prerequisite to study mantle-crust material exchange/reaction by Mg isotopes. However, thus far, little is known about Mg isotopic compositions of the middle and lower continental crust. In the article by Yang et al. in this issue entitled “Magnesium isotopic composition of the deep continental crust,” the authors present high-precision Mg isotopic analyses of high-grade metamorphic terrane samples and granulite xenoliths from China, which represent the middle and lower continental crust, respectively. Large Mg isotopic variation is observed in the deep continental crust, reflecting the combination of several processes, such as continental weathering, involvement of supracrustal materials, and fluid metasomatism. In addition, this article also provides an average Mg isotope composition of the bulk continental crust, which is crucial to future applications of Mg isotopes.

**Keywords:** Magnesium isotope, deep continental crust, high-grade metamorphic terrane, granulite xenolith