Mg isotopes of the Mesozoic Mafic rocks in Eastern Lower Yangtze River Belt

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One of Mg isotope application in geoscience is to trace deep carbon recycling in subduction zone (Li et al., 2015; Yang et al., 2012; Huang et al., 2015). The low δ^{26}Mg terrestrial basalts from the both North China Block (NCB) and South China Blck, eastern China have been suggested to result from interaction of their mantle sources with isotopically light carbonatitic melts derived from the subducted oceanic slab. However, light Mg isotope signature in basalts in NCB did not appere before 120Ma, but only younger than 106 Ma basalts (Yang et al., 2012). In this study, we investigated high-precision Mg isotope compositons of the mafic rocks along the easten Lower Yangtze River belt formed between 100-110Ma (Wang et al., 2014). Our results show that the mafic rocks in eastern LYRB with EMI like Sr-Nd isotopic compositions have δ^{26}Mg values ranging from -0.28‰ to -0.42 ‰ and an average of -0.35±0.04‰ (2sd, n=11), which are relatively lighter than the mantle Mg isotope compositions (-0.25 ± 0.07‰, Teng et al., 2010) and the mafic rocks before 120 Ma in NCB. The nagtive correlations between Nd isotopic compositions and δ^{26}Mg indecated the mantle was influced by recycled deeply subducted ligh carbonatitic melts. Since these maifc rocks still preserve EM1 like Sr-Nd-Pb isotopic compositions and high Ce/Pb and low Nb/U ratios similar to those of mafic rocks older than 120 Ma in NCB, the light Mg isotope compositions is most likely formed by magma mixing between EM mantle, HIMU mantle. We proposed that the mantle trasformation time from EM to DM in Eastern China may be ~110Ma which may caused by delamination of continental crust and enriched mantle.

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