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Re-Os mineral isochron age of peridotite xenoliths from Hannouba, China: Implications for Os behavior in mantle
Re-Os mineral isochron age of peridotite xenoliths from Hannouba, China: Implications for Os behavior in mantle

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Geochemical and isotopic data on mantle peridotite xenoliths provide key constraints on the evolution of lithospheric mantle beneath the thick continental crust. Especially, Os isotopes could give us information on the age of continental roots (Pearson, 1999) and genetic relation of the lithospheric mantle to the overlying continental crust. The continental crust was possibly formed by extraction from primitive upper mantle to form both the lithospheric mantle and the continental crust. However, Re introduction from the host magma or through metasomatism leads to rarely observed reliable Re-Os isochron for peridotite xenolith suites. Gao et al. (2003) successfully obtained the Re-Os whole-rock age of 1910 +/- 220 Ma with an initial ˆ187Os/188Os ratio of 0.1156 +/- 0.0009 for peridotite xenoliths from Hannouba, China. However, five out of thirteen analyses were plotted out of the isochron trend and were eliminated from the regression, which indicates disturbance of the Re-Os system of the samples or analytical problem. In this study, we have analyzed whole-rock samples and minerals such as olivine, orthopyroxene, clinopyroxene and spinel of fresh peridotite xenoliths in continental basalt in Hannouba to make detailed age constraints on the evolution of sub-continental mantle in this area. .

As shown in the figure, most of the Re and Os isotopic data of the whole-rock samples obtained in this study are plotted on the isochron line reported by Gao et al., (2003), implying the geological event at 1.9 Ga. Preliminary results of mineral analysis suggest a Re-Os mineral isochron with a younger age for a suite of Hannouba peridotite xenoliths, indicating that minerals possibly record a younger geological event such as metasomatism or shallow-level processes within the continental crust.

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