

## Age, composition and evolution of the lithospheric mantle in the Nuominhe, Xing'an Mongolia Orogenic Belt

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The Xing'an Mongolia Orogenic Belt (XMOB) located in the eastern portion of the Central Asian Orogenic Belt was formed by accretion and collage of multiple micro-blocks. The crust-mantle evolutionary process in XMOB is not well understood. Previous studies on the Re depleted Os model ages ( $T_{RD}$ ) of the mantle peridotites and the Nd model ages of granites from XMOB show that the formation ages of the lithospheric mantle [1-2] are apparently equal to, or older than, the overlying crust [3]. In order to further evaluate the relationship between the lithospheric mantle and overlying crust in XMOB and discuss the tectonic processes, in this study we selected 35 peridotite xenoliths from the Nuominhe, XMOB for a series of geochemical analyses. These peridotites cover a range of chemical composition from fertile to refractory (e.g., olivine Fo=88.5-91.8). The whole rock highly siderophile element patterns are characterized by variable depletions of Pt, Pd ( $(Pd/Ir)_N=0.04-0.86$ ) and Re relative to Os, Ir and Ru, while there is a large range of  $(Os/Ir)_N$  (0.31-1.42). The peridotites with low  $(Os/Ir)_N$  experienced sulfide breakdown by S-unsaturated melt metasomatism, supported by the scarcity of sulfides in these rocks. No correlation between  $(Os/Ir)_N$  and  $^{187}Os/^{188}Os$  is observed, indicating the recent occurrence of sulfide breakdown and limited influence on  $^{187}Os/^{188}Os$ . The Nuominhe peridotites have three  $T_{RD}$  peak modes, i.e., Neoproterozoic (0.6-0.8 Ga), Mesoproterozoic (1.2-1.4 Ga) and Paleoproterozoic-Archean (2.2-2.5 Ga). Both the Neoproterozoic and Mesoproterozoic  $T_{RD}$  peaks coincide well with the two Nd model age peaks of XMOB granites, respectively, demonstrating assembly of both aged blocks in XMOB [4]. Although the Paleoproterozoic-Archean  $T_{RD}$  age peak does not match with the granite Nd model age peaks, the crystalline basement as old as, or older than, the Paleoproterozoic is suggested to exist in XMOB [5], suggesting that the Nuominhe area has also accreted a Paleoproterozoic-Archean lithosphere block.

[1] Wu et al., 2003. Chem. Geol. 196,107-129. [2] Zhang et al., 2011. Lithos 126, 233-247. [3] Wu et al., 2000. Tectonophysics 328, 89-113. [4] Zhang et al., 2019. Lithos 326-327, 556-571. [5] Meng et al., 2010. Tectonophysics 485, 42-51.