Primordial ages of lithospheric mantle vs ancient relicts in the asthenospheric mantle: *In situ* Os perspective

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Recent studies have shown that volumes of ancient depleted material can survive in the convecting asthenospheric mantle for long periods so that the use of Os model ages of mantle xenoliths to constrain the age of lithospheric mantle events should be approached with caution. In this study, we use *in situ* Os-isotope dating on sulfides in peridotitic xenoliths from cratonic (Tok, Russia) and off-craton (Tariat and Dariganga, Mongolia) settings of the Neoproterozoic-Phanerozoic Central Asia Orogenic Belt (CAOB) to examine lithosphere formation. A few Tok sulfides yield an apparent isochron indicating an age of 3.2 Ga. The high initial $^{187}Os/^{188}Os$ (0.117) of the apparent isochron suggests that it represents a mixing line, possibly involving an Archean component. In Tariat, both T_{MA} ages from the least-disturbed sulfides ($^{187}Re/^{188}Os<0.07$) and T_{RD} ages from higher-Re/Os sulfides yield model ages ranging from 0.5 to 3.0 Ga, with peaks around 1.7-1.5, 1.2 and 0.7-0.5 Ga. These ages suggest that SCLM beneath the Tariat region existed at least by Proterozoic time, and that some domains are Archean. The Os model ages are well-correlated with crustal events recorded in the overlying Precambrian Tarvagatay Terrane. It would be a remarkable coincidence if sulfides derived from randomly selected fragments of refractory materials in the convecting asthenospheric mantle would combine to give such a systematic correlation. We therefore prefer the simplest interpretation: the sulfide Os ages in the Tok and Tariat peridotites record major events that affected the crust+SCLM. The oldest of these events may record major melt extraction, and the later ones metasomatic events. Sulfides in Dariganga peridotites also have Mesoproterozoic Os model ages. Although Proterozoic crustal events have not been reported in this region so far, Proterozoic Nd model ages for basement rocks around the Xilinhot region in the vicinity of the Dariganga Plateau (B. Chen, pers. comm.) suggest that a Precambrian crustal terrain should be expected and might be found by studies of deep-crustal xenoliths in the Dariganga region.

The geochemistry of fluid inclusions in Yimen Sanjiachang copper deposits

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Sanjiachang copper deposits including three copper deposits of Shishan copper deposit, Caiyuanhe copper deposit and Fengshan copper deposit[1]. Shishan Copper deposit is a diagenesis - weak reworked deposit Fengshan copper deposit is a strongly reworked deposit which controlled by diapir structure[2], Caiyuanhe copper deposit is a transitional type of the first two deposits, The fluid inclusions have significant differences of the three copper deposits with the following characteristics: From Shishan copper Caiyuanhe copper deposit Fengshan copper deposit Inclusions size are increase(1.5μm-2.15μm), and number are increase, pure liquid inclusions in order to reduce and liquid inclusions in order to increase, Fengshan copper found gas inclusions (about 15%) and a small amount of NaCl sub-inclusions. From Shishan copper Caiyuanhe copper deposit Fengshan copper deposit gangue mineral homogenization temperatures are gradually increasing there are two homogenization temperature range of 113.4 ~ 194.3 °C (95% of this range) and 220 ~ 320 °C in Fengshan copper deposit-hishan copper depost salinity inclusions have the feature of high K^+ content, low Na^+ content, Caiyuanhe copper deposit and Fengshan copper depost have the feature of high Na^+ content , low K^+ content [2], Fengshan copper has two salinity content range of 4-10% and 12-18%.

The results show that from Shishan copper deposit - Caiyuanhe copper deposit - Fengshan copper deposit is gradually enhanced the role of structural transformation, Fengshan copper mineralization has the characteristics of two and the main ore mineralization in the low temperature of 113.4 ~ 194.3 °C.

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[1] Tian Yulong *et al* (2000). *Acta Mineralogica Scinica* **20**, 73-79. [2] Lei Wang *et al* (2010). *Geochimica Et Cosmochimica Acta* **74**, A1104-A1104.