Geophysical Research Abstracts
Vol. 20, EGU2018-6006, 2018
EGU General Assembly 2018

Geochemical characteristics of mantle xenoliths from the Khamar Daban Ridge, south Russian Siberia

Kuo-Lung Wang (1,2,3), Sergey D'ril (4), Suzanne O'Reilly (3), Mikhail Kuzmin (4), William Griffin (3), and Norman Pearson (3)

(1) Academia Sinica, Institute of Earth Sciences, Taipei, Taiwan (kwang@earth.sinica.edu.tw), (2) Dept. of Geosciences, National Taiwan University, Taipei, Taiwan, (3) CCFS/GEMOC Key Centre, Dept. of Earth & Planetary Sci., Macquarie University, Sydney, Australia, (4) Institute of Geochemistry, Siberian Branch, Russian Academy of Science, Irkutsk, Russia

Mantle xenoliths from basaltic lava at the Miocene Tumusun Volcano in the Khamar Daban Ridge (KDR), south Russian Siberia have been studied to characterize the subcontinenal lithospheric mantle (SCLM) beneath the Slyudyansky terrane. These xenoliths are dominantly spinel-bearing lherzolites. Equilibrium temperatures of these lherzolies range from 950 to 1100 ˚C. The Fo contents of olivine in spinel peridotites range from 89.2 to 90.4 with Cr# in spinel ranges from 0.08 to 0.14. Although most lherzolies fall in the field of "Phanerozoic" range of the Boyd diagram, a few plot toward to the Proterozoic range. The Os isotope compositions of sulfides in these lherzolites reveal the presence of Proterozoic SCLM beneath the KDR region. Their in situ Os isotope compositions (^{187}Os/^{188}Os) ranges from 0.1063 ($\pm$8) to 0.1431 ($\pm$48) with the ^{187}Re/^{188}Os ratios of 0.004-0.862. Both T_{MA} from the least-disturbed sulfides (^{187}Re/^{188}Os$<$0.07) and T_{RD} from higher Re/Os sulfides without later introduction/loss of Os, yield model ages ranging from 0.7 to 3.0 Ga, with peaks around 2.0 and 1.2-1.0 Ga. These ages suggest that the SCLM beneath the KDR region formed at least by the Proterozoic time, and that some domains are Archean. The sulfide Os ages are consistent with these formation events recorded in the overlying crust. Younger sulfide Os ages (1.2-1.0 Ga) may mark the commencement of the Central Asia Orogeny since the Neoproterozoic and involvement of the mantle as suggested by Sengor et al. (1993) and Jahn (2004). This could be the first result showing ancient root beneath the KDR region, consistent with dating results of detrital zircons up to 2.9 Ga from the Slyudyansky terrane (Kovach et al., 2013). Compiling with other at least Mesoproterozoic lithospheric mantle domains revealed by Os model ages from the Vitim, Tariat and Khanka regions (Wang et al., 2011, 2013, 2014), ancient micro-continents are prevailing in the Central Asia Orogenic Belt, which might diminish extents of juvenile crustal growth in the Orogeny as expected before.