European Mineralogical Conference
Vol. 1, EMC2012-448-1, 2012
European Mineralogical Conference 2012

Tracking the evolution of the convecting mantle in ophiolites: the case of the Dobromirtsi Ultramafic Massif, Central Rhodope, Bulgaria

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Commonly chromite-rich rocks (i.e., *chromitites*), which usually occur in the zone between the mantle and crustal sections of *ophiolites*, are enriched in Platinum-Group Minerals (PGMs), many of which have Os as a major component [e.g., Os-Ir alloys, erlichmanite (OsS_2)-laurite(Ru)S_2]. Since the concentration of significant amounts of Cr and PGEs to form the PGM-bearing chromitites would require the melting of several tens of cubic kilometres of mantle, the Os-isotope composition of these PGM may be representative of large volumes of the convecting mantle. Therefore, PGMs in podiform chromitites should provide a faithful and robust record of the osmium-isotopic composition of the Earth's convecting mantle through time. By studying the isotopic and elemental compositions of zircon inclusions in the chromitites, a complementary time dimension is added for determining the geochemical evolution of the convecting mantle, particularly to track ancient residual domains in the silicate Earth. In this communication we report the preliminary results of a survey by in situ LA-ICP-MS isotopic (Re-Os/U-Pb/Lu-Hf) and trace-element analysis on Os-rich laurite and zircons from chromitites of the Dobromirtsi Ultramafic Massif. Re-Os model ages obtained from laurite (n = 100; $^{187}Re/^{188}Os<0.0035$) range from 0.1 to 2.6 Ga with a predominant peak at 0.4Ga and two minor peaks at 0.3 and 0.7Ga assuming an Enstatite Chondrite Reservoir (ERC). These ages indicate a highly depleted mantle source that evolved for long time in a very low Re/Os enviroment. U-Pb concordia ages of two zircons are much older (1925$\pm$41 and 2257$\pm$40 Ma). Trace elements in the zircons indicate an oceanic crustal origin. The correlation of ages > 1.9Ga in both PGM and zircons suggest recycling of Lower-Proterozoic or older oceanic lithosphere, presumably during Silurian-Devonian time.