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PGE- and Os-isotope data of chromites in the Shebeniku ophiolitic complex, Albania: evidence for two stage melting in a supra subduction zone environment

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Chromitites from different pseudostratigraphic levels of the supra-subduction zone (SSZ) Shebeniku Ophiolite, SE Albania, have been studied for petrography, mineral chemistry, platinum group element (PGE) potential, and Os isotopic signature in order to investigate the role of SSZ-influx into chromitite petrogenesis. Microprobe analysis reveal distinct mineralogical chromite suites and show no evidence for sub-solidus re-equilibration or alteration. Chemical signatures thus reflect changes in their primary mineralogical composition and related magmas. Chromites from transition zone dunites have the highest Cr/Al ratios and very low Ti contents making them comparable to spinels of boninitic magmas but clearly distinguishing them from podiform mantle chromites. PGE were determined using Ni fire assay/INAA as well as HPA digestion and ICP-MS techniques. PGE totals throughout the suite of chromitites are low ($< 1\mu$g/g). Mantle-normalized PGE patterns are variably fractionated showing conventional IPGE over PPGE enrichment in the podiform mantle chromitites but also unconventional Ru, Rh, Pt enrichment in transition zone dunites. Pd concentrations are low throughout the suite. Os-Isotopes were determined for selected chromite separates and massive chromitites using HPA-digestion followed by high precision ICP-MS and NTIMS analysis. Podiform mantle chromitites have $^{187}Os/^{188}Os$-isotopic compositions close to the primitive uniform mantle value of 0.1296 whilst chromite concentrates from transition zone dunites show heterogeneous $^{187}Os/^{188}Os$-isotope sig-

natures displaced towards more radiogenic values. Re concentrations throughout the suite are low. Podiform mantle chromitites may represent residues of primary melting of fertile mantle reflected in their IPGE-rich PGE patterns and Os-isotopic mantle signature. Heterogeneous, second stage melting of the IPGE-depleted harzburgite produced melts selectively enriched in Ru, Rh and Pt characterized by heterogeneous $^{187}Os/^{188}Os$-isotope signatures. Presently, isotopic research is aimed at further delineating the possible influence of subduction related input into the petrogenesis of these heterogeneously PGE enriched chromites.