



Petrological significance of platinum-group elements and minerals in the chromitites from Mersin Ophiolite (Southern Turkey)

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Abstract

Disseminated, massive and nodular type podiform chromitites in Mersin (S-Turkey) are hosted by the broad dunitic zones and harzburgites enclosed of dunitic envelopes or lens like bodies within the upper mantle. The chemical composition of chromite minerals have high Cr# $\text{Cr}/(\text{Cr}+\text{Al})$ ratio (0.64-0.80) and Mg# $\text{Mg}/(\text{Mg}+\text{Fe}+2)$ ratio (0.59-0.65) with low TiO_2 (< 0.24 wt%) and Al_2O_3 (9.45-14.26 wt%) wt% content which reflect an occurrence from a boninitic magma. The chromitites were analyzed for platinum-group elements (PGE) and Au, and mineral chemistry. Their PGE and Au content are between Os: 19-40, Ir: 10-45, Ru: 33-90, Rh: 6-20, Pt: 1-81, Pd: 1-28 and Au: 1-6 as ppb. Almost all of the samples are depleted for PGE and exhibiting negative slope in normalized chondrite diagram. The chromitites have relatively higher concentrations of IPGE (Os, Ir, Ru) with respect to PPGEs (Rh, Pt, Pd). It has been suggested a lack of sulphur saturation during an early stage of their crystallization. There have been a few chromitite samples relatively slightly enriched in PPGE (Pd/Ir:1.03-1.48). As a result of optical study and electron microprobe analysis of chromitites, laurite are found as primary inclusion in the chromite minerals. The variation of chemical composition in the laurites from Mersin and Ortaca-Mugla (SW Turkey) are compared in the Ru-Os-Ir ternary diagram. According to little variation of (Ru 0.79-0.85, Os 0.15-0.23) S_2 chemical formulas of laurites from Mersin chromitites in central Taurus ophiolite belt of Turkey have been indicated that the chromite crystallization relatively

has taken place at low and narrow range of sulphur fugacity condition when compared with those of Ortaca (Mugla-SW Turkey) chromitites in southwestern part of Taurus Ophiolite Belt. Considering PGE contents of chromitites and chemical composition of chromites of Mersin ophiolite, seems that chromitite crystallization occurred from mainly a boninitic magma derived by a varying degree of partial melting in a supra-subduction zone environment.