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Compositional fingerprints of chromian spinel from the refractory chrome ores of Metalleion, Othris (Greece): implications for metallogeny and deformation of chromitites within a "hot" oceanic fault zone

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Abstract

The chrome ores of the retired Metalleion mine of the Othris ophiolite comprise a small volume of a pervasively serpentinitized, tabular harzburgite body. These ores have been studied to determine their geological mode of occurrence, mineralogy and chromian spinel (Cr-spinel) chemistry. The ores consist of massive chromitite (85-95% modal Cr-spinel) with mylonitic fabric in imbricate-shaped pods. Chromian spinel displays a limited range in Cr# [$\text{Cr}/(\text{Cr} + \text{Al}) \times 100 = 53-63$] and Mg# [$\text{Mg}/(\text{Mg} + \text{Fe}^{2+}) \times 100 = 59-73$] and low TiO₂ content (≤ 0.11 wt%). Minor- (Ti, Ni, V, Mn and Zn) and trace-element (Sc, Co and Ga) concentrations do not show any significant variations from Cr-spinel cores to boundaries and were not considerably modified by post-magmatic processes. However, Cr-spinel compositions show slight enrichments in Zn and V, and depletions in Ti and Sc when compared to the composition of chromite from the East

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