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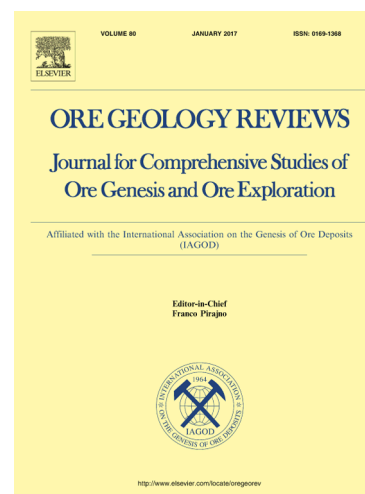
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Processes of primary and re-equilibration mineralization affecting chromitite ore geochemistry within the Vourinos ultramafic sequence, Vourinos Ophiolite (West Macedonia, Greece)

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Abstract

The Vourinos ophiolite is a complete ophiolite sequence covering an area of ~450 km², that hosts the largest chromite mining district in Europe. Chrome ore deposits range in size from several millions of tonnes of Xerolivado-Skoumtsa mine to some thousand tonnes of the smallest exploited ores. Widespread mining activity closed in the 1990s, leaving behind good exposures of chromitite bodies within the closed mines. Samples from 10 of these mines, 4 located in the Northern part of the massif and 6 located in its Southern part, were collected in order to study the spatial variability of chromite and olivine mineral chemistry in these ores at different scales, and to infer the roles of primary magmatic and secondary post-magmatic re-equilibration processes. Chromites from chromitites show higher XCr (0.75-0.87) than scattered spinels in peridotites and serpentinites (0.45-0.70) and largely variable XMg (0.40-0.78). Chromite compositions of North and South Vourinos ores largely overlap, while they show differences at the scale of single deposits, with a remarkable higher XMg at Xerolivado-Skoumtsa. High variability internal to each deposit is due to different re-equilibration conditions at variable olivine/spinel volume ratios. Olivine and chromite XMg values are positively correlated to chromite modal content, while XCr of chromite is not

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