



Petrology of podiform chromites in Sabzevar ophiolites, NE of Iran

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Formation and mechanisms of chromite concentration are quite underestimated in Iranian ophiolites. Some geologists had insisted to divide chromites into Cr-rich, Al-rich and Fe-rich ones. The chromite deposits in Sabzevar could be divided into high Cr-rich ones especially in Gaft and Forumad areas and into less Cr-rich ones in Kuh-siah area. In Frumad area, there are huge chromite deposits undoubtedly preserved by thick dunitic integument, within depleted harzburgites. Massive to nodular chromitites dispersed in the altered dunitic bodies. Nodular chromites show spindle form, because of mantle plastic deformation. The Cr_2O_3 content of these chromites varies between 58 and 60 wt %, while Al_2O_3 content is about 10 ± 1 wt%. In Cr-number versus Mg-number diagram, nodular chromites show highly constant Cr-number (about 76 wt %) and the Mg-number varies between 65 and 67 wt %. In Cr# versus Mg# and TiO_2 diagrams, the nodular chromites occupy the boninitic field and therefore they are highly enriched in Cr. In Kuh-siah area (North of Sabzevar) some small chromite pods with centimetric dunitic cortex are associated with interfingered dunitis, harzburgites and lherzolites. The scattered chromites associated with residual peridotites are characterized by high amount of Al. The Fo percentage of olivines in peridotites vary from 91 to 96 wt %. Opx grains fall in enstatite field and Cpx are diopside in composition. After comparison of Kuh-siah chromites with Frumad ones, it seems that the melt responsible of the formation of Frumad chromites is characterized by picritic composition, while that has been tholeiitic behavior for Kuh-siah chromites. In general view, we proposed that the chromite deposites of Sabzevar ophiolites are essentially formed in SSZ related to back-arc environment.