Petrography, mineral chemistry and genesis of Aland and Gheshlagh Chromite deposits, Khoy ophiolite (NW of Iran)

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(Received: 21/12/2009, in revised form: 13/3/2010)

Abstract: The chromite deposits of Aland (Barajok and Kochak villages) and Gheshlagh area in the Khoy ophiolite occur as layered, lenticular or irregular masses, surrounded by dunite and harzburgites. These chromites are compositionally similar to alpine-type chromites, characterized by nodular, massive, disseminated and banded textures. EMPA data show that they vary widely in term of Cr-number [100Cr/Cr+Al]. On average, Cr# of chromites in harzburgites is 45.13, in disseminate Gheshlagh and Barajok chromites are 40.58 and 58.12 respectively but in Barajok and Kochak Chromitites are 66.7 and 73.43 respectively. The chromite composition in terms of Cr#, Mg#, Cr2O3, Al2O3, Fe2O3, MgO and TiO2 contents as well as correlation coefficients between different oxides, these chromits are comparable to podiform chromitites. The compositions of chromitites from Aland area with Cr#>66% and Gheshlagh area with Cr# about 40 wt% fall within high-Cr and high-Al types respectively. According to TiO2, Cr2O3 and Al2O3 content of the samples, it seems that the Aland chromites were formed from boninitic magmas in a supra-subduction zone although the Gheshlagh chromites were formed from tholeiitic magma in a geotectonic setting similar to the MORB.

Keywords: podiform chromites, boninite, khoy ophiolite, Iran.