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Alireza Eslami, Shoji Arai, Makoto Miura, Mohammad Ali Mackizadeh

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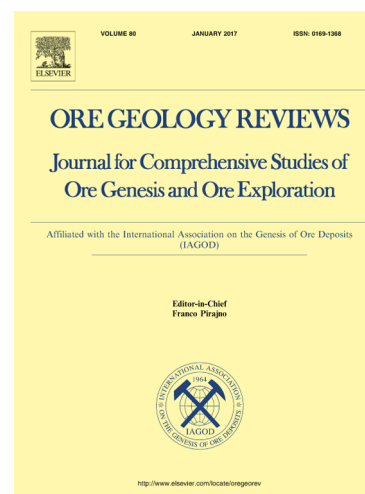
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Metallogeny of the peridotite-hosted magnetite ores of the Nain ophiolite, Central Iran: implications for Fe concentration processes during multi-episodic serpentinization

Alireza Eslami^{1,2*}, Shoji Arai³, Makoto Miura³, Mohammad Ali Mackizadeh⁴

¹ *Department of Economic Geology, Faculty of Sciences, Tarbiat Modares University, Tehran 14115-175, Iran*

² *Department of Geology, College of Science, University of Tehran, Tehran 1417614418, Iran*

³ *Department of Earth Sciences, Kanazawa University, Kanazawa 920-1192, Japan*

⁴ *Department of Geology, Faculty of Sciences, University of Isfahan, Azadi Sq., 8174673441 Isfahan, Iran*

*Corresponding author: A. Eslami.

E-mail address: alireza.eslami@modares.ac.ir

Abstract

Magnetite bodies of the Late Cretaceous Nain ophiolite mélangé (Central Iran) are hosted by a small volume of a serpentinized peridotite nappe. These ore bodies and their host peridotites have been studied in detail with respect to their mode of occurrence, petrography and mineral chemistry. The investigated ore deposits consist of m-scale lenses and pods of massive magnetite rocks exposed along a semi-brittle shear zone between pervasively serpentinized harzburgites, upper one with higher-Cr# [= Cr/(Cr + Al), 0.6-0.7] spinel and lower one with lower Cr# (0.5). Silicate mesostasis of the ore bodies is composed of stringy serpentine and chlorite. Cr-spinel grains are occasionally found dispersed within the magnetite rocks. Serpentine of the host serpentinized harzburgites show mesh and bastite textures, and were in part replaced by fibrous serpentine showing an interpenetrating texture. The Cr-spinels show a wide range of Cr# (0.5 to 0.7) and Mg# [= Mg/(Mg + Fe²⁺), 0.5-0.7], low TiO₂ contents (< 0.1 wt%), and relatively high contents of ZnO (0.11-0.26 wt%) and MnO (0.33-0.43 wt%). The magnetites are close in chemistry to the end-member Fe₃O₄, but some grains show high-SiO₂ (up to 1.5 wt%) cores. They strongly resemble accessory Cr-spinels in the host serpentinized harzburgites in chemistry. The magnetite rocks have total

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