Investigations on olivine and spinel mineral chemistry and tectonic setting of peridotites from north west Piranshahr ophiolite, NW Iran

M. Yazdani¹,²*, A. Jahangiri¹, M. Moazzen¹, R. Hajialioghli¹, M. Ahangari³

¹- Department of Geology, Faculty of Natural Sciences, University of Tabriz, Tabriz, Iran
²- Department of Mining, Faculty Of Education Center Of Miandoab, Urmia University, Tabriz, Iran
³- Department Of Geology, Faculty of Sciences, Urmia University, Tabriz, Iran

(Received: 17/6/2013, in revised form: 12/10/2013)

Abstract: According to the olivine and spinel chemistry, two types of peridotite were identified from west north Piranshahr ophiolite. Peridotite rocks are classified based on chemistry of spinel and olivine. Average number of Cr in spinels (Cr#[(100*Cr/(Cr+Al))]) and Mg-number (Mg#[100*Mg/(Mg+Fe)]) in dunite are 0.63 and 0.51 respectively. In harzburgite, Cr# is 0.33 and Mg# is 0.67 and in spinel from serpentinite Cr# is 0.45 and Mg# is 0.55. Also in dunite, Cr/Al is 1.6, in harzburgite Cr/Al is 0.49 and in spinel from serpentinite Cr/Al is 0.81. According to chemistry of spinel and olivine, there are two types of peridotite with different tectonic setting in the Piranshahr ophiolite (which age is upper cretaceous). Discriminant diagrams indicate that dunite is supra-subduction peridotite with a forearc setting, whereas harzburgite and serpentinite are abyssal peridotite. Two different tectonic settings in peridotites of this region are comparable with the Oman ophiolite in Oman-Zagros ophiolitic belt.

Keywords: Oman-Zagros ophiolitic belt; Piranshahr ophiolite; supra-subduction peridotite; abyssal peridotite; chromium spinel.

*Corresponding author, 09143811360, Fax: (044) 45245725, Email: myazdani1387@yahoo.com