# Composition of serpentine after olivine and orthopyroxene: Serpentinized peridotites of Nain ophiolite (Isfahan Province, Iran)

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**Introduction**

The Naein ophiolite is one of the most complete ophiolitic suits at the East of Central-East Iranian Microcontinent - ophiolitic belt and it comprises a high proportion of serpentinized mantle peridotites [1]. As a possible alteration product of Nain mantle peridotites, serpentine constructed the veinlets and the mesh texture, characterized with a pale green-white chalky feature. The fibrous serpentine filled the cracks and veinlets are crossing the mesh texture and this indicates their former formation.

**Raman Spectrometry and Microprobe Data**

Raman Spectrometry of the serpentine suggests that the mesh texture is made of lizardite and the rock veinlets are filled by chrysotile. Based on major element data, lizardite is $Mg_{3.00}$ $Fe_{0.31}$ $Ni_{0.01}$ $Si_{1.84}$, with $Al_2O_3$= 0.00 wt%, Mg#=0.91, Cr#=0.00 in composition and chrysotile is $Mg_{2.14}$ $Fe_{0.10}$ $Al_{0.23}$ $Cr_{0.02}$ $Si_{2.18}$, with $Al_2O_3$= 2.84-5.97 wt%, Mg#=0.96, Cr#=0.10.

**Disccusion of Results**

Lizardite is characterized with higher Mg, Fe and Ni in while chrysotile is higher in $Al_2O_3$ and Cr#. [2] suggested that serpentine after orthopyroxene (bastite) are generally low in MgO (~ 34–37 wt.%), but have silica similar to serpentine after olivine (38–42 wt%). MgO of the studied chrysotile (~ 30-32 wt%), formed after orthopyroxene are generally higher than MgO of lizardite (~ 29 wt%), formed after olivine (i.e. lizardite), but the silica has a similar range (~ 43-54 wt%) in chrysotile and lizardite. The low Mg and high Cr and Al of chrysotile is a consequence of the composition of the original orthopyroxene (e.g., [3]; [4], [2]). Therefore, Al-rich serpentine of chrysotile is found in orthopyroxene bastite with lower MgO and FeO contents, and higher $Al_2O_3$ and $Cr_2O_3$ concentrations, while the lizardite is the serpentinization product of olivine.

[1] Shirdashtzadeh *et al.* (2013) Lithos (Submitted). [2] Shervais *et al.* (2005) Inter Geol Rev **47**, 1-23. [3] Dungan (1979) Can Min **17**, 77 l-784. [4] Wicks & Plant (1979) Can Min **17**, 785-830.