Petrogenetic implications of mineral chemistry of the mantle diopsidites in the eastern part of the Sabzevar ophiolite (northeastern of Central Iran)

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Abstract: In the eastern part of the Sabzevar ophiolite, southeast of Soleymanieh, there are white to pale greenish veins of diopsidite with 1–15 cm width inside mantle serpentinitized harzburgites. The center of these veins is rather homogeneous and includes a monomineralic clinopyroxen with granular texture. The contact between the pure clinopyroxene and its host peridotite is always progressive and characterised by replacement textures and minerals. The host harzburgite has also been affected by diopsidization. There are patches of cores grain altered plagioclase and clinopyroxen with inclusions of serpentine in the host harzburgite. The mineral assemblage, field relationships and mineral chemistry of the mantle diopsidites in the eastern part of the Sabzevar ophiolite indicate that they are product of circulation of very high temperature hydrothermal fluids (550–900 °C) rich in Si, Ca, Mg, CO$_3^{2−}$, SO$_4^{2−}$ and Cl$^{−}$ in the upper mantle. These fluids leached plagioclase rich lithologies before penetrating the mantle.

Keywords: Ophiolite; Sabzevar; diopsidite; petrogenesis; Central Iran

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