

The use of textural and mineralogical evidence for determination of melt-rock reaction, partial melting and origin of Kermanshah peridotites

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Abstract: The Kermanshah ophiolite complex is located in outer Zagros ophiolitic belt and consists of both mantle and crustal suites as remnants of southern branch of the Neo-Tethys Ocean in Iran. Chemical composition determinative diagram of minerals indicates that olivine in dunite, harzburgite and lherzolites has forsteritic composition and in wherlitic rocks is chrysolite in composition likewise orthopyroxene and clinopyroxene in these rocks are enstatitic and diopside to augitic composition respectively. Textural evidence such as exsolution lamellae of clinopyroxene in orthopyroxene and chain-like grains of spinel in minerals of ultramafic rocks of Sahneh, Harsin-Nourabad and Myanrahan region displaying clear evidence of cooling with decompression, partial melting and melt-rock reactions. Very low modal of clinopyroxene, Mg rich olivines and high Cr# content and Cr/Al ratio of chromian spinel from ultramafic cumulates indicate that dunites and harzburgitic rocks have formed by high degrees of partial melting. Calculated TiO₂, Al₂O₃ and FeO/MgO ratio in the parental melt that was in equilibrium with chromian spinels and also all of used discrimination diagrams are compatible with a forearc boninitic magma (such as picrites or island arc tholeiites) in supra-subduction zone setting.

Keywords: *Mantle peridotite; boninite; arc; melt-rock reaction; Kermanshah ophiolite.*

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