

The role of fractional crystallization in the evolution of magma of the Upper Cretaceous volcanic and subvolcanic rocks from the Nageleh Sar Syncline, south Mahmood Abad, North Iran

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Abstract: The Upper Cretaceous volcanic and subvolcanic rocks from the Nageleh Sar, south of Mahmood Abad town in north Iran are dolerite, olivine basalt, trachyandesite and alkali trachyte. These units in an ordered stratification are set in a way that creates a syncline with WNW-ESE axial trend. The chemical data and discrimination diagrams represent medium alkaline bimodal series for the studied samples. REE and incompatible trace elements patterns indicate that they mostly originated from a mantle source similar to OIB with orthopyroxene, clinopyroxene, and olivine in terms of mineralogical content. Variation diagrams and patterns on spider diagrams imply that the parental magma evolved by dominant process of fractional crystallization. The diagrams of major and trace elements ratios clearly show that fractionated phases are often clinopyroxene, amphibole, iron, and titanium oxides. The generating magma of these rocks has been contaminated by crustal materials to some extent and emplaced in an intercontinental rift setting.

Keywords: *Nageleh Sar; volcanic rocks; Upper Cretaceous; intercontinental rift; alkaline series; fractional crystallization.*

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