

Characterization of Mineralogy, Geochemical and Origin of Nephelinitic Jurf Ed-Darawish Volcano in Western Central Jordan

Authors : Hassan Alfugha

Abstract : The Cenozoic volcanism in west central Jordan, which shows homogeneous lava from the upper mantle. It is represented by nephelinitic scoria, cones and flows and covers approximately 10 km². Fourteen nephelinitic rock samples were collected at Jurf ed-Darawish volcano to analyze major, minor and trace elements by using XRF. Geochemical parameters of these samples such as Mg/Mg+Fe+2 the ratio range from 0.41 to 0.45 and high Ti contents 3.09-3.28 wt% indicate that the corresponding magmas are nearly of primary origin. This magma shows low variable abundances of compatible and incompatible trace elements reflecting a homogeneous source. The studied volcanic rocks, which are mainly nephelinites belong to the alkaline rocks series containing 4.38-5.95 wt% alkali oxides. They are usually undersaturated in regard of the silica content, which ranges between 39.88-41.50 wt% value compared to other Jordanian basaltic rocks. Major, minor and trace elements data as well as mantle xenoliths, entrained in the volcanic rocks, are spinel lherzolites that suggest the lithospheric mantle as the source for the Pleistocene volcanism. These xenoliths resided at shallow mantle depths (45 km) because a geothermobarometric analysis yielded P-T conditions close to 15 kbar and 1100°C. The mantle nodules did not equilibrate with the melts indicating a fast transport from the mantle to the surface and a magma >65 km deeper source area of the melts.

Keywords : Nephelinitic, geochemical, volcano, magma

Conference Title : ICEGGG 2025 : International Conference on Experimental Geology, Geochemistry and Geophysics

Conference Location : Toronto, Canada

Conference Dates : June 19-20, 2025