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Petrography and mineral chemistry of the Almanden garnet, and implication for Kelyphite texture in the Miocene alkaline basaltic rocks North East Jordan

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The Miocene alkali basaltic rocks cover the northeastern part of Jordan, within Harrat Al- Shaam plateau. The volcanic concentrated along the Dead Sea boundary and spread around the north east of Jordan area, and considered as interplat volcanic field in Jordan. The volcanic basalt are associated with xenoliths fragmental rocks or xenocryst minerals. Nine samples were collected from the study area and analyzed for XRD, XRF and SEM. These samples presented the xenoliths rocks and minerals existing in the study area. This study focused on the garnet and pyroxene xenoliths minerals in Tulayl Al-Hasna area within Ufayhim Formation. Hand samples are characterized by coarse aggregates of garnets up to (2cm in diameter) with dark brown to red color, and highly fresh fractures. Also, the pyroxene (< 1.5cm) with gray to dark green color, and the olivine (rang 3-4mm) are pale green to dark green and pale yellowish color. In thin sections, plagioclase phenocryst in the garnet presented as corona texture. In addition garnet surrounded by orthopyroxene, this refers to kelyphite texture. Two type of kelyphite texture fibers and radial as shown in Scanning Electron Microscope photomicrograph. The mineralogical analyses of garnet for X-Ray Diffraction are composed of almandine, pyrope and majorite. The existence of minerals reflects the high pressure and temperature of the upper mantle origin. The chemical analysis showed that the average composition of garnet as follow (Alm 42.78, Pyro 41.04, Gross 16.18), pyroxene (Wo 16.90, Fs 20.37, En 62.73). This referred to present of the following elements Mg, Fe and Ca in the garnet. As a result, the basaltic garnet xenoliths were from shallow lithosphere mantle origin.

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