Mineralogical and Geochemical studies of Zeolitic tuffites in Damavand-Firuzkoh area, East of Tehran

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Abstract: This study focused on the upper parts of Karaj Formation in Damavand-Firuzkoh area. Field study indicated that the green tuffites of Karaj Formation in Kilan, Hesarbone, and Zarindasht irregularly altered and changed to zeolite and bentonite. Microscopic studies of zeolitic tuffites have shown that the main components of these tuffites are altered glass shards. The shards changed to zeolites from their margins. In addition to zeolite, clay minerals also changed to glass shards. Scanning Electron Microscopic studies confirmed the change of glass shard to zeolite and clay mineral from their margins. The presence of clinoptilolite and carbonate impurity in vitric altered tuffite are determined by thermal curves tests (TG & DTG). Also, X-ray showed clinoptilolite, crystobalite as major mineral and muscovite, montmorillonite as minor mineral in these tuffites. On the base of XRF and ICP, chemical composition of these tuffites are in the range of acid to intermediate rocks compositions. Chemical composition of altered and unaltered tuffites is unique. Base on the petrological studies, the componential magma of the tuffites is calc alkaline. Spider diagrams indicated the enrichment of K, Ba, Th, Rb, which is characteristic of arc magmatism.

Keywords: Tuffite, Zeolite, Firuzkoh, Clinoptilolite.