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Mineralogy of the Plio-Quaternary potassic to ultra-potassic post-collision volcanic rocks from NW Iran

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Potassic to ultra-potassic volcanic rocks of Plio-Quaternary age crop out in the NW Iran in northern part of Urumieh Dokhtar magmatic arc (UDMA). Based on chemical composition, they are classified as tephrite, phonotephrite and basaltic trachy-andesite. They shows porphyritic to microlithic porphyry texture and contain phenocrysts and micro-phenocrysts of olivine, clinopyroxene, phlogopite, Ti-magnetite, $\pm$ leucite and $\pm$ volcanic glass. The groundmass consists of microlithic plagioclase, microliths of clinopyroxene, phlogopite, titanomagnetite, sanidine and $\pm$ leucite. The olivine phenocrysts are zoned, forestrite- rich (up to Fo 80). Clinopyoxenes phenocrysts are euhedral and often depict oscillatory zoning and are diopside-augite in composition. Some of the clinopyroxenes are rich in Al (up to 5.44%) and shows positive correlation with TiO_2; on the other hand TiO_2 correlates negatively with Mg# and Si. The phologopite compositions plot between siderophyllite and eastonite end members and show Fe/(Fe+Mg) ratios<0.33. Chemical composition of the micas from core of studied studied samples to reaction rims vary from phlogopite to Mg-biotite. In some localities they are also highly enriched in Ba (up to 5 wt. % BaO). Ba in micas correlates positively with Ti and Al, but negatively with K, Mg# as well as with Si. Leucite occurs with trapezohedral form and display complex twinning. Some leucite phenocrysts are replaced by zeolite and calcite along fractures. The obtained mineralogical and geochemical features of the NW Iran ultra-potassic rocks assign them to the Roman Province Type rocks. We suggest that these rocks are formed through post-collisinional event after closure of Neo-Tethys and collision of micro plate of Iran with Arabian plate.

Key words: potassic volcanic rocks; NW Iran; Phlogopite; Plio-Quaternary; Neo-Tethys