Crystal chemistry of phlogopite minerals from Plio-Quaternary potassic volcanic rocks, NW Marand

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Abstract: Plio-Quaternary potassic to high potassic basaltic rocks are found in northern part of Uromieh-Dokhtar Magmatic Arc in NW Iran. The mineralogical composition of these rocks characterized with phenocrysts of Cpx, phlogopite, leucite and olivine in groundmass of plagioclase, sanidine, Cpx and biotite. Phlogopite phenocrysts display a euhedral platy form with reaction rims. Based on the International Mineralogical Association scheme, the phlogopite compositions plot between siderophyllite and eastonite end members and show Fe/(Fe+Mg) ratios<0.33. Based on their TiO2, MgO, MnO and AlVI content, they are primary magmatic micas. The micas contain up to 5 wt% BaO and 8.62 wt% TiO2 and indicate similarity in composition with barian titanian phlogopites from other potassic volcanic rocks in the world. As BaO, Al2O3 and TiO2 increase, the SiO2, FeO, MgO and K2O decrease. In this regard, Different substitutions deduced from such variations, which is common to most magmatic barian micas are discussed. In comparison with other potassic and high potassic volcanic rocks, the studied phlogopites display similarity with phlogopites of Italian Roman type volcanic rocks.

Keywords: volcanic rocks; potassic; crystal chemistry; phlogopite.