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Geothermobarometry and mineral chemistry of ferroanpargasite gabbroic cumulates in volcanic rocks from South of Shahrood

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Abstract: The study area is located about 110 Km south of Shahrood in north of Central Iran structural zone. There are many cumulate enclaves with ferroanpargasite gabbroic composition within the Middle Eocene basic volcanic rocks in the study area. Amphiboles are one of the most important minerals in gabbroic cumulates and host basaltic rocks. Based on results of electron microprobe analyses, amphibole minerals present in these cumulates, according to leake et al. classification are calcic and show ferropargasite compositions. Plagioclase shows a notably CaO-rich composition and has normal zoning from anorthite in the core to bytownite at the rim. Clinopyroxene composition range between calcic augite and diopsite. According to the amphibole geobarometer of Schmidt, amphiboles in these gabbroic cumulates are crystallized at ~7.5 Kbar corresponding to a depth of ~26 Km. Geothermometry of amphiboles of these rocks also were calculated with different thermometer and range from 830 to 860^{0C}. The low contents of HREE and La/Yb and Dy/Yb ratios of gabbroic cumulstes suggest that their parental magma was probably formed by relatively high degree of partial melting (16 to 18%) of the mantle.

Keywords: *Mineral chemistry, Geothermobarometry, Gabbroic cumulates, South of Shahrood.*