Mineralogy, geochemistry and tectonic setting of amphibolites from Mahmoudabad metamorphic complex (SE Shahindezh)

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Abstract: Mahmoudabad metamorphic complex is a part of Sanandaj-Sirjan metamorphic zone that cropped out in SE Shahindezh. Metapelites are the main lithology of Mahmoudabad complex and there are restricted exposures of foliated and granoblastic metabasites present in this complex as well. Metabasites of this complex are investigated in this research. Metabasites display amphibole and plagioclase mineralogy that indicating amphibolite facies. Chemical composition of plagioclase is andesine and labradorite and amphibole is magnesiohornblende and tremolite. Thermobarometry results, that calculated by different methods, display temperature between 430 to 750 centigrade and pressure 6 to 13 kilo bars that are almost equivalent geothermal gradient between 20 to 25 centigrade per kilometer. According to the whole rock geochemical data, the amphibolites of Mahmoudabad complex are orthoamphibolite type and are mostly basaltic in composition. Geochemical signatures of these amphibolites are compatible with tectonic setting of continental back arc. Probably, Mahmoudabad complex amphibolites, are indication of mafic magmatism in the continental back arc setting, arisen from Neotethy oceanic basin seduction beneath continental lithosphere of Sanandaj-Sirjan, that have been experienced collision or continental active margin metamorphism.

Keywords: amphibolite; thermobarometry; continental back arc setting; Mahmoudabad metamorphic complex.