

Petrology and geochemistry of the metamorphic rocks in the SW Arak and its comparison with neighboring areas

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(Received: 9/3/2014, in revised form: 9/7/2014)

Abstract: Metamorphic rocks in SW Arak composed from two groups including regional and contact metamorphism. Regional metamorphic rocks are composed of slate, phyllite and micaschists and located in green-schist facies and contact metamorphic rocks are composed of spotted schist and hornfels respectively. Mineralogically, these rocks are composed of quartz, chlorite, muscovite, biotite and cordierite. Petrographic studies of these rocks show that cordierite mineral formed during contact metamorphism. On the basis of mineral chemistry, the Chlorite has ripidolite compositions and muscovite is rich in the muscovite end-member. Based on calculations, chlorite mineral in regional metamorphic rocks in the study area have formed at temperature of 387-416 °C and low-to medium pressure. According to the microscopic studies, field observations and obtained analyses of samples from different protoliths, the rocks have been sedimentary and graywacke or shale type. Major and trace elements concentration (e.g. K₂O, TiO₂, Rb, Ni) indicates that the primary igneous rocks was acidic (andesite to rhyodacite). In comparison with average of upper continental crust, the rocks of studied area of P, Sr, Ba, Ti negative anomalies and of Rb, K positive anomalies that cause replacements of these elements during metamorphism and alteration. Discriminations diagrams of tectonic setting indicate a subduction Zone. Using major oxides elements, the continental active margins considered for metapelites source.

Keywords: *green-schist facies; cordierite; ripidolite; protolith; subduction; Arak.*

متن فارسی اصل مقاله از صفحه ۲۹۵ تا ۳۰۸ در این شماره به چاپ رسیده است.

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