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Geothermobarometry of metapelites of southwest Mahneshan, using multiple equilibria curves and THERMOCALC program

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Abstract: Pressure and temperature of metamorphism in the Mahneshan area were estimated in order to determine the type of metamorphism and tectonic setting of the rocks. Biotite, muscovite, plagioclase, garnet, quartz, andalusite and staurolite minerals are crystallized together in metapelites in the regional metamorphic rocks of southwest Mahneshan. Chemistry of coexisting minerals is studied using microprobe analysis. Using multiple equilibria calculations and THERMOCALC program, temperatures of ~520°C and pressure of ~3 kbar have been calculated for the formation of these rocks. Using these data, geothermal gradient of 60 °C/km has been calculated for the upper crust of the Mahneshan. Based on calculated geothermal gradient, the Buchan type metamorphism is suggested for the metamorphic rocks of southwest Mahneshan.

Keywords: *Geothermobarometry, metapelites, Buchan type, multiple equilibria, Mahneshan, THERMOCALC.*