Mineral chemistry and geothermobarometry of the metapelites of Geysour metamorphic complex, east of Gonabad

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Abstract: Geysour area, east of Gonabad, is a part of the northern Lut block. The rocks in this area include granitoid and a series of metamorphic rocks. In metapelitic rocks, the presence of S₁ schistosity and the mineral chloritoid are indicative of regional metamorphism. The presence of random textural evidence in minerals such as andalusite, staurolite, muscovite and post-tectonic garnet and silimanite growth within the andalusite margin is characteristic of contact metamorphic rocks. The mineral garnet has two stages of growth, and mainly contains the end-members of Almandine, Grossular and Spessartine. Chloritoid and staurolite are ferrous. Muscovite has little paragonite replacement. Chloritization of biotite and garnet, sericitization of andalusite and the occurrence of radial micro-cracks in garnet all indicate a retrograde metamorphism and uplift. Based on conventional geothermobarometric methods, temperature and pressure were calculated in the range of 550-608 °C and 3.8-4.5 Kbar, respectively. The existence of radial micro-cracks around quartz inclusions in garnet is due to a large component of isothermal decompression.

Keywords: Geysour; Gonabad; regional metamorphism; contact metamorphism; geothermobarometer; Lut block.

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