

## The study of mineral chemistry and thermobarometry of kyanite-bearing rocks in metamorphic complex of Hamedan area

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**Abstract:** The study area is located in Hamedan Province adjacent to Alvand plutonic body in the Sanandaj-Sirjan zone. Various contact and regional metamorphic rocks, from low to high grade exist in contact of Alvand plutonic body including schists, hornfelses and migmatites. Kyanite-bearing rocks volumetrically are not widespread but occur as various outcrops (in migmatite, hornfels and quartz-kyanite veins). Kyanite occurs in these rocks with minerals such as andalusite, sillimanite, staurolite and sometimes cordierite with a matrix of quartz, biotite and muscovite and sometimes plagioclase. In the Hamedan region, kyanites can be divided into three major types: 1- Kyanites in the rock matrix, 2- Kyanites pseudomorphs after andalusite porphyroblasts, and 3- Kyanites in aluminosilicates veins. Since, triple or diploid intergrowth of aluminosilicate are not seen in thin sections, it can be concluded that they formed in different stages of metamorphism. Regional metamorphism in the area resembles Buchan-type metamorphism but addition of kyanite to mineral assemblages converted to Barrovian-type metamorphism. The composition of garnet is plotted near almandine, biotite composition, often located in the field of siderophyllite and composition of plagioclase crystals is andesine in these rocks and staurolite is iron-rich. In thermometry by Ti and XMg in biotite, mesosome of migmatites show temperature of 633°C and biotites in hornfelses show temperature 483°C to 587°C. In thermometry by cation exchange, garnet- biotite (average temperature by all of the calibrations) temperature for hornfels is about 524°C to 580°C and for migmatite 618°C, respectively. In barometry equilibrium thermodynamics method (GPBQ) gives pressure of 3.8 kbar and (GASP) method gives 4.1 kbar for mesosome of kyanite-bearing migmatites.

**Keywords:** *Hamedan; thermobarometry; mineral chemistry; migmatite; hornfels; kyanite.*

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