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Mineralogy and mineral – chemistry of tourmaline and garnet from Molataleb village granitoid (North of Aligudarz) NW of Isfahan

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Abstract: The Middle Jurassic granitoids from Molataleb village lie in the Sanandaj-Sirjan zone. This body located, NW of Isfahan, and is predominately composed of tonalites and two-mica peraluminous granodiorites cross cut Jurassi (Liass-Dogger) shales and slates. Tourmaline and garnet are among significant minor minerals of the granodiorites. Subhedral to anhedral tourmaline with pleochroic brown-green to blue color occurs as small amount among other minerals of these rocks. On the bases of chemical data as wall as geochemical diagrams, the studied tourmalines are characterized by weak chemical zoning, more Mg than Fe and deravite in composition. The content of other end members (schorlite, uvite, foitite) is insignificant. Mg-tourmalines, are associated with metamorphic or metasomatic assemblages. The origin of these minerals is likely related to meta-sedimentary rocks (i.e. meta-pelites and meta-psammites) coexisting with a Al-saturated phase. The studied garnets are anhedral, rimmed and cross cut by veins contain small crystals of biotite and muscovite. In few cases, both biotite and muscovite are found in investigated garnets. Locally, garnets are surrounded by chlorite crystals. Chemically, the garnet is almandine with a rim relatively enriched in spessartine and fairly depleted in pyrope. The revers zoning is characteristic of high grade-metamorphic garnet and point to its crystallization in a low-pressure system. The high content of Mn in residual liquids derived from the crystallization of magma, caused the stability of garnet. On the bases of available data, the pelitic deposits (Lower Jurassic), have been subjected to progressive regional metamorphism (upper amphibolite – lower granulite) followed by partial melting of meta-pelites. The studied garnets (Fe-Mg phases) formed at or near the climax of metamorphism.

Keywords: *Granitoid; tourmaline; garnet; mineral chemistry; Molataleb; Sanandaj-Sirjan.*

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