The formation mechanism of tourmaline nodules in Boroujerd area (Dehgah-Sarsakhti)

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Abstract: Based on the field observations host rock of tourmaline nodules in the Dehgah and Sarsakhti area are acidic dikes (Aplite) and monzogranite respectively. In these areas, nodules composed of tourmaline, quartz, alkali-feldspar, but leuco minerals component in Dehgah nodule are less than Sarsakhti area. The negative anomaly of Eu, enrichment in the light REE (LREE), decrease of HREE, and fractionated REE chondrite normalized patterns in host rocks in these area suggest that crustal granites produced by partial melting of metapelitic rocks. Zoning, schorlite to dravite composition, nodules concentration in roof zone of the batholithe, decreases in abundance with depth, low ratio of Fe/Fe+Mg in some nodule (dravite), clear halo and miarolitic cavities in Sarsakhti area are evidences that exsolution of their fluid phase occurred at low rate and reacted to volatile to wall rocks (metapelites) fluids and are composed from magmatic – hydrothermal conditions. However, tourmalines in Dehgah area, with schorlite composition, host rock with planar structural (aplite), lack of zoning and clear halo, and lack of miarolitic cavities suggest that boron rich volatile has not been reacted with wall rocks (metapelites) fluids and in a perfect magmatic condition, immediately percolated to acidic dikes and caused in the final crystallization of tourmaline nodules. Therefore different rates of boron and its fluid behavior in the hydrothermal-magmatic system is the major factor controlling of spherical shape tourmaline nodules in the two studies areas.

Keywords: Sarsakhti; Dehgah; Tourmaline nodule; schorlite – dravite.