

Origin of tourmaline in micaschists of Gol-e-Gohar metamorphic complex from south-eastern Sanandaj-Sirjan Zone (Baft, Kerman Province)

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Abstract

In Gol-e-Gohar micaschists from south-east Sanandaj-Sirjan Zone (Kerman province), there are tourmaline crystals which are enriched in Mg and Na (Mg: 1.830 a.p.f.u and Na: 0.680 a.p.f.u), and so, they are dravite in compositions belonging to alkaline series. The delineated combinational profiles from core to rim from these tourmalines display a weak compositional zoning. Evidences such as the existence of quartz inclusions in these minerals, equilibrated boundaries between the tourmalines and biotites in all cases and the orientation of some tourmaline crystals along with other metapelite-forming minerals and weak chemical zoning in them indicate that they formed during or after acting tectonic forces and metamorphic events. Moreover, chemical composition of the studied tourmalines, such as F<0.3 wt%, FeO*<0.8 wt% and positive correlation between Mg and Fe contents indicate that these minerals have been produced by metamorphic reactions. It seems that with increasing temperature during and after metamorphism, boron released from the surface of clay minerals and concentrated in interstitial fluids. Then, boron-rich fluids reacted with other silicate minerals such as biotite to form tourmaline. A weak chemical zoning in the studied tourmalines implies this phenomenon

Key words: tourmaline, micaschist, Gol-e-Gohar complex, Sanandaj-Sirjan Zone

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