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COMPOSITIONAL VARIATION IN TOURMALINE FROM ORBICULAR AGGREGATES IN LEUCOGRANITES, MOLDANUBIAN ZONE, CZECH REPUBLIC

NOVÁK, M. & BURIÁNEK, D. (Masaryk University, Brno, Czech Republic)
E-mail: mnovak@sci.muni.cz

Felsic peraluminous leucogranites with accessory tourmaline are widespread in orogenic belts, e.g. the Hercynian belt in Europe (northwest Spain, Massif Central and Brittany in France). Tourmaline is randomly disseminated in rock but it also may form orbicular aggregates consisting of tourmaline + quartz ± feldspar intergrowths.

Tourmaline bearing granites, both disseminated and orbicular types, are quite widespread in the Moldanubian Zone, Czech Republic. Orbicular granites, fine to medium grained rocks without apparent preferential orientation, occur in dikes and small intrusive bodies, up to several hundred m thick. Tourmaline poor matrix consists of quartz, K-feldspar, albite–oligoclase, minor muscovite, very rarely biotite and tourmaline. Typical accessory minerals include apatite, zircon, ilmenite and andalusite. Quartz-tourmaline orbicules, up to 10 cm in diameter, commonly with a narrow, leucocratic, biotite free halo are distributed randomly in granite or concentrated to linear zones, up to 10 m thick, with abundant orbicules. They also occur in border units of some granitic pegmatites.

Chemical composition of tourmaline from orbicules, Al rich schorl to schorl-dravite, is similar to that of the tourmalines from granites and Li poor granitic pegmatites and slightly overlaps the metapelite and metapsammite field (HENRY & GUIDOTTI, 1985). The Z site is fully occupied by Al; the Y site shows ^{Y}Al 0.96–0.24, Fe 1.89–1.18, Mg 1.10–0.36; low concentrations of Mn, Zn and Ti are typical. The X site exhibits Na 0.70–0.54, Ca 0.13–0.03 and $^{X}\square$ 0.44–0.16; F contents vary from 0.39–0.05 (all given values in *apfu*). Tourmaline is slightly heterogeneous in the X site, but highly variable in the Y site, Fe/(Fe+Mg) = 0.84–0.52. Tourmaline from single localities exhibit low to high variation in Fe/Fe+Mg.

The tourmaline-quartz orbicules seem to be a product of crystallization of evolved, B rich medium (melt and/or fluid) during late solidus to early subsolidus stage of the granite formation. The high Mg/Fe ratios at some localities examined suggest that the parent leucocratic and B rich melts exhibit rather low degree of geochemical fractionation. Consequently, the formation of granites with tourmaline + quartz orbicules is not limited only to highly fractionated melts with low Mg/Fe ratio (see SINCLAIR & RICHARDSON, 1992, NOVAK *et al.*, 1997).

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