Geothermobarometry of micaschists with staurolite (Crni Vrh - Serbia)

Kristijan Sokol
University of Belgrade, Faculty of Mining and Geology, Belgrade, Serbia (sokol_kristijan@hotmail.com)

Micaschists, that are characterized by very large staurolite porphyroblasts reaching up to 10 cm in size, occur in the southwestern part of the Paleozoic crystalline complex in Serbo-Macedonian massif at Crni Vrh (in the vicinity of Bagrdan). Beside quartz, mica (muscovite and biotite) and staurolite, these micaschists contain garnet porphyroblasts up to 0.5 cm in size and a smaller amount of plagioclase, too. Accessory minerals are tourmaline, ilmenite and apatite, while secondary chlorite also occurs.

Micaschists display porphyroblastic texture with some lepidoblastic character. Staurolite occurs in the form of euhedral to subhedral grains, in which the inclusion of quartz and mica are common. According to its chemical composition, the investigated staurolite is nearly an ideal ferruginous hydrated alumosilicate with a relatively low magnesium content (MgO = 0.2-1.5%).

Euhedral garnet porphyroblasts also contain inclusions of quartz and mica. According to its chemical composition, the garnet is generally 65-73% almandine with 12-18 % pyrope component but a smaller amount of spessartine component (5-8 %) also occurs, whereas the contents of grossular and andradite are negligible.

The average temperature of metamorphism for these micaschists, calculated on the base of garnet – biotite geothermometer is 580±50°C. According to the garnet – plagioclase – kyanite – quartz geobarometer, the obtained pressure is 6.1 ± 0.5kbar.