Granitic Rocks from Branisko Mts. (Western Carpathians): Geochemistry, Mineralogy and Tectonic Implications

Katarína BÔNOVÁ1 and Igor BROSKA2

1 Institute of Geography, Faculty of Sciences, Pavol Jozef Šafárik University, Jesenná 5, 040 01 Košice, Slovak Republic
2 Geological Institute of the Slovak Academy of Sciences, Dúbravská cesta 9, 842 26 Bratislava, Slovak Republic

On the basis of textures, mineral composition and geochemical characteristics, the granitoid rocks of Branisko crystalline basement form two separate main groups: 1) syn-collision peraluminous leucocratic granites and granodiorites widely distributed in the S and W part of Branisko crystalline basement; 2) post-collision granodiorites inhabited mainly in the NE part of mention crystalline basement. Available mineralogical and geochemical data reveal that these two groups can be characterised by different magmatic evolution or protolith history.

The first group shows rather evolved geochemical characteristics. Major and trace element geochemistry of (leuco)granites indicate their crustal origin. The main rock-forming minerals are K-feldspar + quartz + albite (An0–3) + muscovite; essential accessory mineral phases are apatite, zircon (Si, L1–3 types), monazite, xenotime, garnet ± rutile whereas REE contents (La/Yb ~ 19) are particularly controlled mainly by monazite. EMPA dating of monazite yielded age 342 ± 15 Ma for leucocratic granites (Bônóvá et al. 2005). Granodiorites which are occurred in western part of Branisko crystalline basement show slightly different features in comparison with granodiorites–tonalites from NE side. Higher volume of K-feldspars and significantly lower content of biotite or other mafic minerals is their dominant feature. Biotite exhibits a high total Al contents, reaching up to ~ 3.2 apfu and Fe/(Fe+Mg) ratio varies within 0.49 to 0.53 what indicates the I-type character of host rock. Concerning to the Fe valency, higher content Fe3+ (up to 20 wt. %) is characteristic for biotites from Sokol and Sopotnica granitoid bodies, whereas biotites from Tahanovce granitoid massif show decrease Fe2+ content (around 5 wt. %). Such relation indicates the typical I-type oxidizing conditions due to the presence of higher water content during Sokol and Sopotnica granitoid evolution. Biotites from Tahanovce area imply more reducing conditions with lower water content, and this is characteristic for the S-type granites.

According to the biotite chemistry we assume the affinity of granitoids from Sokol and Sopotnica massifs to the I-type granitoid suite which has been formed from slightly differentiated magma with mantle contribution. Contrary to that, Tahanovce granitoid body and granitoids from Miklušovce complex show affinity to the S-type granitoid suite due to the precipitation of Fe-biotites from multiply contaminated melt by crustal material.
Apatite Fission Track Thermochronology of Tuff Layers


References


**Attempt to Dating of Accretion in the West Carpathian Flysch Belt: Apatite Fission Track Thermochronology of Tuff Layers**

Dariusz BOTOR1, István DUNKL2, Marta RAUCH–WŁODARSKA3 and Hilmar von EYNATTEN2

The Carpathians are a part of the European Alpine chain created by convergence and collision of the European and African plates (Golonka et al. 2000). The Outer Western Carpathians are a north-verging fold-and-thrust belt composed largely of Lower Cretaceous to Lower Miocene flysch sediments arranged into stacked complex of several nappes (from top to bottom: Magura, Dukla and Fore-Magura, Silesian, Sub-Silesian and Skole nappes. The tectonic evolution of the Outer Carpathians is subdivided into two successive shortening events: 1) NNW-(N) directed and 2)NE-(NNE) directed (Aleksandrowski 1989, Decker et al. 1997). During the first event the folding and thrusting started in the most inner, southern nappe (Magura nappe) and were