

## References

- KONEČNÝ V., ŠEFARA J. and ZBOŘIL L., 1975. Investigation of deep structures in the basement of Central Slovakia young volcanic region and their classification with respect to Neogene volcanism. Proceeding of the Xth Congress CBGA, 3, GÚDŠ, Bratislava, pp. 209-227.
- KONEČNÝ V., LEXA J. and ŠEFARA J., 1978. Vzťah vulkanizmu k morfológickým štruktúram predvulkanického podložia (Relation of volcanism to basement morphotectonic structures). Open file report, GS SR, Bratislava.
- KONEČNÝ V., LEXA J. and HOJSTRICOVÁ V., 1995. The Central Slovakia Neogene volcanic field: a review. *Acta Vulcanologica*, 7: 63-78.
- LEXA J. and KONEČNÝ V., 1999. Geodynamic aspects of the Neogene to Quaternary volcanism, In: M. RAKÚS (Editor), Geodynamic development of the Western Carpathians: Geological Survey of Slovak Republic, Bratislava, pp. 219-240.
- NEMČOK M. and LEXA J., 1990. Evolution of the basin and range structure around the Žiar mountain range. *Geol. Zborník*, 41: 263-268.
- NEMČOK M., HÓK J., KOVÁČ P., MARKO F., MADARÁS J. and BEZÁK V., 1993. Tektonika Západných Karpát v terciéri (Tectonics of Western Carpathians during Tertiary). In: M. RAKÚS and J. VOZÁR (editors), Geodynamický model a hlbinná stavba Západných Karpát. Geologický ústav D. Štúra, Bratislava, pp. 263-268.

# Phase Changes in Medium -Temperature Metagranites – – An Example of the St. Catherina Dome and its Continuation below the North Bohemian Basin (Krušné hory Mts., Bohemian Massif)

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St. Catherina dome is exposed at the western margin of the Bohemian Massif in the central part of the Krušné hory Mountains. Its core and northern limb are represented mainly by Neo-Proterozoic porphyritic granitoids deformed with various intensity during the Variscan orogeny. Similar metagranitoids appear in boreholes which reached the basement of the North Bohemian Basin. These metagranites were interpreted by MLčoch (1994) as a direct continuation of the St. Catherina dome to the E under the Tertiary sediments.

Several metamorphic and microstructural changes can be observed in metagranites with low intensity of deformation and these are identical in samples from the exposed part of the St. Catherina dome and from the basement of the North Bohemian basin. Phase changes are represented mainly by the crystallization of garnet on the contact between biotite and plagioclase. Garnets rich in calcium and manganese form several  $\mu\text{m}$  thin rims around biotite crystals. Biotites in immediate vicinity are unstable and form microscopic intergrowths with quartz or feldspars. Garnet also appears as irregular clusters within muscovite-rich domains usually associated with fine-grained aluminosilicate. These muscovite-rich domains probably represent pseudomorphs after some Al-rich minerals (cordierite?) forming primary mineral assemblage of undeformed granite.

Microstructural observations suggest that the crystallization of garnet is a result of the reaction  $\text{Plg} + \text{Bt} + \text{SiO}_2 = \text{Kf} + \text{Gt} + \text{H}_2\text{O}$  or, alternatively  $\text{Plg} + \text{Bt} + \text{SiO}_2 = \text{Ms} + \text{Gt}$  in the CNKFMASH system. We have performed estimates of metamorphic temperatures using garnet-biotite thermometer and these preliminary results show that garnet originates at temperatures of 600–650°C. We have no direct evidence, which of K-bearing phases represents product of the above-described reaction. However, it is likely that the later formulation is correct as the stabilization of K-feldspar at the expense of muscovite and biotite is restricted to relatively high temperatures. Preliminary estimates of metamorphic temperatures provide values fairly well corresponding to those estimated for the Krušné hory parautochthon. Further work will be focused on thermodynamic modelling of garnet-producing reactions in terms of pressure and temperature. Particularly the pressure estimates are crucial for understanding the tectonic relationship between orthogneisses of the St. Catherina dome and the overlying high-pressure metasediments.

## References

- MLČOCH B., 1994. The geological structure of the crystalline basement below the North Bohemian brown coal basin. *KTB Report*, 94 (3): 39-46.