Magnetic Anisotropy of Mafic Magmatic Enclaves in the Nasavrky Massif and its Bearing on the Massif Emplacement

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Magnetic fabrics of mafic magmatic enclaves and of the host granodiorite of the earlier intrusion were investigated in the Nasavrky Plutonic Complex (E Bohemia). It has been revealed that the magnetic fabrics in the enclaves are oriented coaxially with the magnetic fabrics of the host granodiorite which are undoubtedly of a magmatic (intrusive) origin. Also the intensities and symmetries of the magnetic fabrics in the enclaves and in the granodiorite are similar. Consequently, the magnetic fabric in the enclaves originated during the same process as the magnetic fabric in granodiorite, i.e. during the granodiorite emplacement, and the enclaves had probably a similar viscosity to that of the granodiorite and behaved as passive particles whose shapes resembled those of the intrusive strain ellipsoids.

Anisotropy of Magnetic Susceptibility (AMS) of an Extremely Fractionated P-rich, Rare-metal Granite: Podlesí Stock, Krušné Hory Mts., Czech Republic

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The Krušné hory (Erzgebirge) Mts. are one of the classical metallogenic provinces located near the southern margin of the Saxothuringian Zone of the European Variscides, at the north-western edge of the Bohemian Massif. The Podlesí granite stock in the western Krušné hory Mts. represents an extremely fractionated, strongly peraluminous, F and P-rich, rare-metal granite system of Late Variscan age. The stock is formed by medium to fine grained albite protolithionite topaz granite ("stock granite"), without visible magmatic foliation and lineation, and shows geochemical and textural zoning. Within the uppermost part of the stock, the stock granite is intercalated with fine grained albite zinnwaldite topaz "dyke granite" layers 0,5-7 m in thickness, also without magmatic fabrics, and with a few thin flat dykes of pegmatite. The dyke granite and pegmatite are even more enriched in P, F and Rb than stock granite (Breiter 1997). No chemical zoning of the rock-forming minerals, either from the upper or lower parts of the stock granite was observed. In contrast, alkali feldspars and zinnwaldite from the dyke granite and pegmatite show well-developed chemical zoning. Thus, the mineralogical data, melt inclusion in quartz and whole-rock chemical data from all rock types provide evidence for two stages of granite evolution, namely crystallisation from parental and residual melts.

The anisotropy of magnetic susceptibility (AMS), which is a geophysical method of the investigation of the preferred orientation of magnetic minerals in rocks, was used to determine the structure of the above extremely fractionated granites. The principal aims of this study were as follows: 1) to find out whether there is, in addition to the chemical zonation, also a structural zonation, and whether both zonations conform to each other, 2) to reveal whether the magnetic fabrics are primary (magmatic flow) in origin or they have been affected by younger deformations, 3) to determine the orientation of magnetic foliation and lineation and reveal whether they are flat-oriented, corresponding to the layered structure, or steep, rather following the ascending movements of the stock, 4) to study structural relationships between individual rock types.

References

BREITER K., FRÝDA J., SELTMANN R. and THOMAS R. 1997. Mineralogical Evidence for Two Magmatic Stages in the Evolution of an Extremely Fractionated P-rich Rare-metal Granite: the Podlesí Stock, Krušné Hory, Czech Republic. *Journal of Petrology*, 38, 12, 1723-1739.