

during its intrusion into metamorphic series. The fine- to medium-grained biotite granite to granodiorite represents the prevailing rock of the pluton, the amphibol-biotite quartz diorite and younger porphyric muscovite pegmatitic granite to pegmatite occur less frequently. The granite tectonics is well developed in the rocks of the pluton, the steep S-planes have the NW-SE trend and Q & L-planes are mostly perpendicular to them. The results of the recently published dating show the Lower Viséan age for the main intrusion (Rb-Sr whole rock ages) and its uppermost Carboniferous cooling one ($^{39}\text{Ar}/^{40}\text{Ar}$ ages). The intrusion comes after the main Variscan tectonic and metamorphic events and has been recently linked by some authors with the late Variscan extensional tectonic regime in the Silesicum.

The bulk magnetic susceptibility of the Žulová pluton is relatively homogeneous and low, mostly ranging from the upper part of the order of 10^{-5} to the lower part of the order of 10^{-4} (in SI of units). This low susceptibility implies that the magnetic fabric is probably controlled by paramagnetic silicates (biotite), even though minor effects of magnetite cannot be excluded.

The anisotropy degree of the rocks of the Žulová pluton is relatively low, $P < 1.05$ in the most specimens; only in a few specimens it reaches values up to 1.2. The magnetic fabric is very variable, ranging from clearly linear to clearly planar. The magnetic foliations of the most specimens are flat, only minor specimens show moderate dips and in rare specimens the dips are very steep up to upright. The magnetic lineations of the most specimens are sub-horizontal, in minor specimens they show moderate plunges and virtually none are vertical. The predominant orientation of the magnetic lineations is NW-SE.

The relatively low anisotropy degree and the magnetic fabric ranging from linear to planar imply that the magnetic fabric of the Žulová pluton is intrusive in origin. The magnetic foliations, being mostly flat, cannot contribute very much to solving the problem of the magnetic fabric origin. The magnetic lineations are virtually perpendicular to those in the neighbouring areas of the Rychlebské hory Mts. and the Hrubý Jeseník Mts. This implies that the magnetic fabric in the Žulová pluton was not affected by the tectonic movements that formed the structures of the above mountains.

A Model for the Mechanism of the Alpine Overprint of Magnetic fabric in the Late Variscan Vepor Pluton granitic rocks, Western Carpathians

František HROUDA^{1,2}, Marián PUTIŠ³ and Ján MADARÁS⁴

¹ AGICO Inc., Box 90, CZ-321 00 Brno, Czech Republic

² Institute of Petrology and Structural Geology, Charles University, Albertov 6, CZ-128-43 Praha, Czech Republic

³ Department of Mineralogy and Petrology, J.A. Comenius University, Bratislava, Slovak Republic

⁴ Dionýz Štúr State Geological Survey, Mlynská dolina 1, Bratislava, Slovak Republic

In the Veporic unit of the Central Western Carpathians, the magnetic fabrics are roughly coaxial in metamorphic and granitic rocks of the basement and in sedimentary rocks covering the basement. This coaxiality can be most simply explained by assuming an effect of the ductile deformation, probably Alpine (Cretaceous) in age, on all the rock types and overprinting up to obliterating their magnetic fabrics. However, there is a problem of the temperature-pressure conditions under which the deformation took place. They should have been high enough to soften the strong metamorphic and granitic rocks sufficiently to be deformed ductilely, and low enough not to transform the soft sedimentary cover rocks into macroscopically identifiable metamorphic rocks.

In mylonitized granitic rocks, the primary magmatic minerals, among which Ti-rich biotite, preserving its flaky form with abundant small needles of rutile (sagenite) and leucoxene inclusions are the most conspicuous, are recrystallized into the newly-formed Alpine mylonitic/metamorphic mineral assemblage: quartz, albite, epidote, clinozoisite, chlorite, low-Ti biotite₂, sericite-phengite, titanite₂, leucoxene, ±calcite, garnet (grossular-rich) forming the mylonitic fabrics. Plagioclase and biotite₁ are substituted by finely-flaked aggregates of muscovite-phengite. Plagioclase and potassium-feldspars are replaced by albite with intergrowths of sericite and epidote-clinozoisite. In places, large titanite crystals are resorbed by magmatic plagioclase, thus

indicating magmatic origin of at least a part of titanite, too. Part of gneissous and migmatitic mantle of granitoids was changed to Alpine Cld-Grt(Alm with Grs rich rim) meta-schists. The temperatures of 450–480 °C were estimated on the basis of petrogenetic grid, mechanical behaviour of rock-forming minerals and measured CPO fabrics. The pressures of 800–900 MPa were estimated using Phe geobarometer in mylonitic rocks, where an association of phengite with biotite and potassium-feldspar is present.

The age of the intrusion of the Vepor pluton is Late Variscan (U-Pb ages on zircon are 295 ± 5 Ma for granites to granodiorites and 303 ± 2 Ma for tonalites, Bibikova et al. 1990). A muscovite-phengite concentrate of a granite mylonite was dated at 83.9 ± 0.4 Ma by the ^{40}Ar - ^{39}Ar method (Dallmeyer et al. 1993, 1996). The ages of 93 ± 7 and 88 ± 4 Ma of the finely-flaked fraction (<0,3 mm) biotite₂ were obtained by the Rb-Sr method (Bibikova et al. 1990).

As the magnetic fabrics in metamorphic and granitic rocks are coaxial with the deformational magnetic fabrics of the Permian-Mesozoic sediments of the Cover Formation, it is likely that their formation took place during the above Alpine metamorphism. The originally strong metamorphic and granitic rocks were softened due to metamorphism and underwent ductile deformation which gave rise to coaxial magnetic fabrics in metamorphic, granitic and sedimentary rocks of the Cover Formation.