

# Mineralogy and Thermobarometry of the Jawornickie Granitoids, Rychlebske Hory

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Determination of the temperature and pressure characterizing the formation and emplacement of intrusive rocks could be crucial for deciphering evolution of orogenic belts. This could be done from the character of the mineral assemblages in intruded country rocks, but there may be great uncertainties in this method, as discussed by Hodges and McKenna (1987). So the best way is to estimate final equilibration, i.e., consolidation of the magma, directly from magmatic mineral assemblages in the granitic rock. However, consolidation takes place over a range of P-T- $f_{O_2}$ - $f_{H_2O}$  conditions that could be imperfectly preserved in phase equilibrium or, more likely, still poorly understood. Further, some mineral assemblages commonly undergo subsolidus re-equilibration. Therefore, although thermometry and barometry of granitic rocks gave already considerable amount of information, a great care must be taken in interpretation of the results. In this paper, using available thermometers and barometers, the P-T conditions of emplacement and deformation of the Jawornickie Granitoids are determined.

Jawornickie granitoids, in the form of dikes and sills, are constituent of the Złoty Stok-Skrzynka tectonic zone. This zone consists predominantly of multiply deformed, medium-grade metasediments, gneisses and amphibolites. The details of evolution of the Złoty Stok-Skrzynka tectonic zone, such as amount of deformation episodes, spatial development of structures, the duration of the event, and the effects of granite emplacement processes are poorly understood. The same could be said about P-T conditions constrains. According to Kozłowska-Koch (1973) and Smulikowski (1979) dominant fabric has been developed under conditions typical of high-temperature amphibolite facies  $T = 650 - 700$  °C and  $P = 2.0 - 2.5$  kb. No further constrains have been made. The Jawornickie Granitoids are considered to be syn-tectonic on the basis of the field structural observations in the country rocks (Burchart 1958; Cwojdzński 1977). On regional scale, the margins of the main dike, 1–1,5 km thick, and smaller granitoid dikes are parallel to the country rock foliation. However, on the mesoscale these dikes locally crosscut the main foliation in the country rocks.

Analyzed plagioclase has the composition of oligoclase. Anorthite content varies in a range of 11 to 25%, with minor amount of K-feldspar (up to 0.6). Most of crystals are normally

zoned, but grains with reverse zoning are also present. Biotites have quite uniform Fe/(Fe+Mg) ratios 0.4–0.55, and Ti content 0.11–0.15 (based on 11 O). Amphiboles have the composition of edenitic hornblende or pargasitic hornblende. White mica, if present, shows preferred orientation in foliated granites. Si atoms p.f.u. vary in range 6.14–6.22.

The temperature estimates derived from the calibration of reaction edenite-richterite of Holland and Blundy (1994), considered to be the lowest and most reliable, yield 660–730 °C. Al-in-hornblende barometer is not precise method for determining the depth of formation. However, as numerous analyse yield similar results, ~ 5,5 kbar, the reliability of the data increases considerably (the experimental calibration of Schmidt (1992) was used for barometric component). Pressures and temperatures obtained from the amphibolite sample collected in the Złoty Stok-Skrzynka tectonic zone yield 4.4–6 kbar and 620–660 °C.

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# Development of Fracture Networks in the Melechov Massif and their Analysis

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Objective of the study is the determination of geometry of main fracture systems developed in the Melechov massif. We concentrate on genetic criteria of the fracture systems origin, their succession and behaviour during the later reactivation. The internal part of the Melechov massif is composed of a com-

plex of granitic bodies considered to be the northern part of the Moldanubian pluton. The marginal parts of the Melechov massif are built of fine- to medium-grained granites of the Kouty and Lipnice types which are exposed in several quarries and are objective of this study. The studied area, mainly located in