

Geochemistry of the Doboszowice Orthogneiss and its Correlation with Rocks of the Silesicum and Moravicum

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The Doboszowice Metamorphic Unit formed mostly by orthogneiss is exposed in the eastern part of the Sudetes (SW Poland). Doboszowice orthogneiss can be correlated with the Bíteš orthogneiss on the basis of geological relationships and macroscopic features.

Orthogneisses from the Doboszowice and Pomianow Gorny quarries are mostly leucocratic, banded, fine- to medium-grained rocks with indistinct augen structures. Two-mica orthogneisses prevail. The matrix is composed of recrystallized mosaic of feldspar and quartz alternating with bands of micas. Flame perthites and myrmekites are common. Cathodoluminescence study revealed a number of different generations of feldspar as well as oscillatory zoning of some grains.

The orthogneisses are silica-rich (73-78 wt% of SiO₂), calc-alkaline. They are peraluminous with A/CNK in the range from 1.05 to 1.35. Trace element geochemistry suggests the evolution of the orthogneiss from mostly two-mica, syn-collisional granite derived from a sedimentary protolith. The very low K/Rb ratio (below 100 in some samples) indicates a hydrothermal fluid activity probably during the retrogressive metamorphism.

The Doboszowice orthogneisses are quite different from Bíteš and Keprník gneisses. On the other hand, their petrographical character and geochemistry indicate a conspicuous relation between the Doboszowice and Snieznik orthogneisses. Unfortunately, these results do not correspond with the preliminary results of the Pb - Pb and U - Pb zircon dating done by A. Kröner (pers. comm.), which indicated an age of 379 ± 1 Ma for the orthogneisses from Doboszowice and 523 Ma from Maciejowice. These ages contrast with the ages of ca. 500 Ma obtained for the Snieznik orthogneiss (Oliver et. al. 1993, Kröner et. al. 1994).

References

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