HIGH PRESSURE AND LOWER TEMPERATURE METAMORPHISM ALONG THE NORTH-EASTERN MARGIN OF THE BOHEMIAN MASSIF

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Several occurrences of high-pressure low-temperature rocks are known from the northern border of the Bohemian Massif (Krkonoše-Jizera complex and Krušné hory Mts., CHÁB & VRÁNA, 1979; PATOCKA et al., 1996). We studied mafic and phyllitic rocks from three localities (•elezný Brod, Roprachtice and Rýchory) including nearby basement units. The rocks are strongly retrogressed into greenschist facies assemblages. Only some primary basalts or gabbros may have glaucophane. Blueschist facies assemblages in meta-basites involve one or more of the minerals: blue amphibole, epidote, albite, chlorite, titanite and aegirine. Surrounding phyllitic rocks contain porphyroblasts of chloritoid in fine-grained matrix composed of white mica, quartz and chlorite. Some chlorite forms porphyroblasts with interlayers of white mica.

Amphibole composition ranges between sodic and calcic amphibole. Some blue amphibole grains reveal a continuous transition towards rim to actinolite. This suggests equilibrium conditions between these two amphiboles after peak pressure or increase of temperature during metamorphism. Blue amphiboles have composition ranging from glaucophane to riebeckite with X_{Al} = 0.37 0.75 and X_{Mg} = 0.4 0.68. Calcic amphibole corresponds to actinolite. Analyzed sodic pyroxene, rich in aegirine (Di_{43-48}, Aeg_{40-45}) with low jadeite content (Jd_{8-12}), was found in metagabbro, where it replaces primary igneous pyroxene. Epidote is rich in Fe (X_{Al} = 0.656 - 0.886). Accessory biotite is rich in Fe (X_{Mg} = 0.535 - 0.699) and chlorite has X_{Mg} = 0.37 - 0.622. Surrounding phylites contain porphyroblasts of Fe-chloritoid (X_{Mg} = 0.078 - 0.083), chlorites (X_{Fe} = 0.64 - 0.68) and white mica (Si = 3.2a.p.f.u.). PT conditions, estimated based mineral compositions of blue amphibole, chloritoid, phengite, are confirmed by mineral assemblages in metabasites that are comparable with the epidote blueschist composition 6 of EVANS (1990). Textural relations indicate decompression to greenschist facies conditions that resulted in formation of actinolite, biotite, albite and chlorite.

Pelitic rocks from the adjacent basement units contain greenschist facies to lower amphibolite facies assemblages. Most of these rocks are characterized by the presence of porphyroblasts of albite that cross-cut older foliation. In one case a garnet- and chlorite-rich sample with relics of amphibole was found. Garnet is rich in Fe ($Alm_{67-72}Grs_{27-32}Py_{1.2-2.3}Sps_{1.2-2.5}$) and amphibole corresponds to taramite (Si = 6.1 a.p.f.u.) with X_{Mg} = 0.34 and X_{Na} = 0.31, where the B site is occupied by 0.508 Na p.f.u. Chlorite (X_{Mg} = 0.38) is always a retrograde phase in the rock. The presences of sodic-calcic amphibole as well as of porphyroblast of albite suggest medium-pressure conditions of basement rocks. However the relation to the blueschist event is not clear yet.

References

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