



Pseudomorphs after amphiboles in Zalas volcanic rocks (South Poland)

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Rhyodacitic porphyries of the Zalas are one of the Upper Paleozoic silicic volcanites of the Krzeszowice area in South Poland. They form a latitudinally-elongated elliptical laccolith with the longer axis slightly below 4 km. Country rocks of the laccolith exposed in places include shales with intercalations of sandstones, limestones and sedimentary breccias. Both the porphyries and the country rocks are erosionally truncated and overlain by sandstones, marls and limestones of Middle and Upper Jurassic.

The porphyries of the Zalas were subjected to complex postmagmatic alterations resulting in diversity of these rocks. The main types include grey, green, rusty-pink, red, whitish and black rocks, the last variety currently not exposed. All of them have similar mineral composition and structural features but differ in the type and intensity of secondary alterations. They must correspond somehow to magmatic and postmagmatic processes that took part in the magma chamber.

The black and grey porphyries are the least, whereas the whitish the most altered rocks of the laccolith. In the black variety, pseudomorphs after amphiboles contain relicts of hornblende, small flakes of biotite and orthopyroxene. The remaining secondary minerals include quartz, feldspars and hematite. In the grey variety the prisms of hornblende are replaced, mainly from the margins, by biotite. Green variety reveal chloritization of hornblende while in the red porphyries smectites replace chlorites. Hornblende relicts are absent in the last rock type. The most altered whitish porphyries contain mainly adular, quartz, opaques, kaolinite, smectites and seladonite.

Optical microscopy, scanning electron microscopy (SEM), energy and wave disper-

sive spectrometry (EDS, WDS) and X-ray powder diffraction (XRPD), were used to examine pseudomorphs after amphiboles.

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