

Metamorfní reakce epidotu v žilách alpského typu na granát-anortitové symplektity: Markovice, kutnohorské krystalinikum

Metamorphic reaction of epidote in Alpine-type veins to garnet-anorthite symplectites: Markovice, Kutná Hora Unit (Bohemian Massif)

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VRÁNA S., JANOUŠEK V., LACIOK A., HALODOVÁ P., ŽÁK L. (2016) Metamorfní reakce epidotu v žilách alpského typu na granát-anortitové symplektity: Markovice, kutnohorské krystalinikum. *Bull. mineral.-petrolog. Odd. Nár. Muz. (Praha) 24, 2, 224-229. ISSN 1211-0329.*

Abstract

Amphibolite quarry at Markovice near Čáslav, eastern Bohemia, is known as an important mineral locality producing high-quality mineral specimens for more than 100 years. Mineral assemblages feature dominantly Alpine-type minerals. A student study by V. Janoušek and A. Laciok in 1988, guided by the late Professor L. Žák, dealt mainly with epidote-group minerals. Above all, the study provided detailed characteristics of garnet-anorthite symplectite formed by destabilization of clinozoisite-epidote. The symplectites often preserve outer crystal shapes of the original clinozoisite-epidote crystals. Minor relics in the symplectite show that the original clinozoisite-epidote contained 8 - 9 wt. % Fe₂O₃. The reaction $Ep \rightarrow Grt + An (+ O, H_2O)$ at $T \approx 600$ °C involved important Fe reduction, as the resulting garnet contains Alm 39.3, Adr 4.2, Grs 48.9, Prp 4.8, Sps 2.3, Uv 0.5 (mol. %). It is suggested that the geological and metamorphic evolution of the local amphibolites of the Kutná Hora Crystalline Unit included the following stages: 1) the older regional metamorphism that was instrumental in alteration of mafic volcanics and tuffs into amphibolite, 2) the brittle deformation, extension and fluid activity resulted in fractures with druses of clinozoisite-epidote, 3) in the course of a younger metamorphic event, the clinozoisite-epidote reacted under reducing conditions and its dehydration led to the formation of the studied garnet-anorthite symplectites, 4) later on, already at shallow crustal levels, late-Variscan, low-temperature fluids brought about crystallization of zeolites and hydrated silicates. The temporal sequence of processes is interpreted in terms of a polymetamorphic history of the host Kutná Hora Crystalline Unit. A repeated find of garnet-plagioclase symplectites replacing epidote crystal clusters in 2005 prompted preparation of this paper.

Key words: epidote, garnet symplectite, Alpine-type paragenesis, amphibolite-facies metamorphism, Kutná Hora Unit, Bohemian Massif, Variscan

Obdrženo: 21. 9. 2016; přijato: 4. 12. 2016