PŮVODNÍ PRÁCE/ORIGINAL PAPER

Podmínky vzniku mineralizace rudních sloupů ložiska Zlaté Hory-jih: pohled ze studia fluidních inkluzí

Formation conditions of ore shoots of the Zlaté Hory-South deposit: insights from fluid inclusion study

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Abstract

Genesis of massive base-metal sulphidic ores from discordant ore shoots of the Zlaté Hory-South deposit has been characterized using fluid inclusion petrography, microthermometry, and Raman analysis. The studied sample is composed of quartz, pyrrhotite (partly replaced by pyrite), galena, chalcopyrite, native bismuth, bismuthinite, and younger siderite and chlorite hosted by veinlets. Quartz-hosted fluid inclusions belong to three compositional types: H_2O-CH_4, H_2O-CO_2 and H_2O. Continuous evolution of carbonic phase from methane-dominated compositions to CO_2-dominated ones has been documented. The studied ore assemblages originated during retrograde phase of Variscan metamorphism at temperatures between ~220 and 300 °C and pressures between 0.7 and 2.0 kbar. Significant fluctuations of pressure recorded in the fluid inclusions indicate involvement of crack-seal mechanism during formation of ore shoots. The early phase of ore-forming process was characterized by high CH_4/CO_2 ratio and the presence of ethane, which is incompatible with source of fluids in local overmatured greenschist-facies rocks of the Vrbno Group. We thus interpret this portion of fluids to be externally derived from adjacent unmetamorphosed Culmian siliciclastic sediments. The influence of methane-rich fluids diminished rapidly during further evolution as the role of local metamorphic H_2O-CO_2 fluids with low CH_4/CO_2 ratios increased. The changes of fluid composition, pressure and temperature were the key factors causing the crystallization of ores in the studied ore shoots.

***Key words**: fluid inclusions, H_2O-CO_2 fluids, methane, metamorphic remobilization, ore shoots, stratiform sulphidic deposits, Zlaté Hory Ore District*

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