resulting from overprinting of older, asymmetric patterns (still recognizable in relicts) by younger ones, originated during late strain increment. The temperature was too low to affect the fabric elements such as kinematic indicators, but high enough to reorientate the quartz CPO.

Contrasting Types of Paleofluids in Volcano-Sedimentary Complex of the Barrandian Upper Proterozoic

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The contribution summarizes fluid inclusion study of three localities in the Barrandian Upper Proterozoic rocks that underwent different sedimentary, diagenetic and metamorphic development. The rocks are mostly anchimetamorphosed or low-grade metamorphosed.

1. Příbram locality (60 km SSW of Prague)

Lithological variability and the presence of cherts and oolitic limestones is typical for the Upper Proterozoic rocks in "Second Slate Belt" N of the town of Příbram. Two and three-phase H_2O-rich, H_2S-rich and mixed inclusions were measured in recrystallized calcite with distinct but undeformed lamellas in oolitic limestone. The recrystallization of calcite is probably connected with hydrothermal fluid mobilization during diagenesis (Žák et al., in prep.).

H_2S-rich inclusions homogenized to liquid between 72 and 87 °C (D = 0.51 to 0.625 g/cm³). H_2O-H_2S inclusions have variable liquid to vapor ratio of 0.1 to 0.5 and represent the mechanical mixture of H_2O-rich and H_2S-rich phase. The melting of solid H_2S was observed at -87.3 to -87.5 °C, close to triple point of H_2S (-82.9 °C). H_2S homogenized to liquid between 73 and 85 °C (D = 0.52 to 0.62 g/cm³). Water-rich inclusions have consistent liquid to vapor ratio of about 0.9. Homogenization temperatures were measured between 185 and 200 °C, salinity is about 2.4 wt.% NaCl equiv.

All the types of inclusions are believed to be trapped contemporaneously under conditions of heterogeneous environment of partial immiscibility between liquid-rich H_2O-rich inclusions and vapor-rich H_2S-rich inclusions. The rough estimation of PT conditions of trapping of inclusions is of about 200 °C and 13 MPa.

2. Mítov locality (30 km SE of Plzeň)

Submarine volcanic and volcaniclastic rocks together with sedimentary rocks of this area underwent submarine basalt-sediment-water interaction. Fluid inclusions were studied in bitumen-rich inter-pillow fillings of pillow lavas of spilitized basaltic andesites (Dobeš and Dubessy 1995).

Primary inclusions in calcite of concentric texture growing on lava pillows contain water solution with low salinity (c < 10 wt.% NaCl equiv.) and Th between 225 and 315 °C. The majority of the inter-pillow matter is formed by dark-coloured quartz and coarse-grained calcite with H_2O-rich or CH_4-rich inclusions or mixed inclusions. Methane (D = 0.162 to 0.363 g/cm³) contains about 3 mol.% CO_2 and 1 mol.% of N_2 + H_2S. H_2O-rich inclusions have low salinity between 1 and 7 wt.% NaCl equiv. and Th in the interval of 135–207 °C.

The inclusions are believed to be trapped under the conditions of immiscibility of water solution and methane in heterogeneous environment at temperatures of ≤ 200 °C and pressures of 50 to 100 MPa.

3. Hromnice locality (20 km NNE of Plzeň)

Fluid inclusions were measured in syn-metamorphic quartz and carbonate veinlets bearing grainy pyrite, and Zn, Ni, Cu, and Mo sulfide mineralization. The veinlets are hosted by black shales (Pašava et al. 1996).

H_2O-CO_2 inclusions have variable liquid to vapor ratio and contain 8 to 58 mol.% CO_2, with the density of CO_2 equal to 0.605 to 0.870 g/cm³. The melting temperatures of CO_2 ($TmCO_2$ = -57.5 to -61.6 °C) are lower than the triple point of CO_2 (-56.6 °C) and indicate the presence of additional gas components (CH_4, N_2). The total Th range of fluid inclusions with LVR of about 0.8 is 270 to 312 °C and the salinity of water solution varies from 1.0 to 4.0 wt.% NaCl equiv. Inclusions syngenetic with the H_2O-CO_2 type seem to be those filled with CO_2 only. The density of CO_2 is 0.665 to 0.920 g/cm³ and $TmCO_2$ is equal to -57.7 to -60.8 °C.

The wide range of compositions and volume fractions, as well as the variable densities of CO_2, show that the inclusions are the result of heterogeneous trapping of two originally unrelated fluids under the conditions of partial mixing of CO_2-rich and H_2O-rich fluid (T < 350 °C and P not exceeding 240 MPa).

In conclusion, despite of the relatively different PT conditions of trapping of inclusions from the individual localities, all the fluid inclusions were trapped at heterogeneous environment under the conditions of immiscibility of water-rich and gas-rich phase. On the other hand, the types of gases trapped in inclusions reflect diverse facies-lithogenetic environment, as indicated by other geological and geochemical observations. H_2S-rich inclusions in carbonate rocks close to Příbram are characteristic of relatively shallow diagenetic environment, CH_4-rich inclusions from Mítov correspond to reducing environment of sub-sea floor metamorphism, and finally, quartz-carbonate veins with CO_2-bearing inclusions from Hromnice formed during late metamorphic processes.

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