(Lashkevitsch et al., 1995, Varitchev, 1997, Medvedev and Varitchev, 2000). The LILE behavior could result from melting process induced within mantle wedge above subducted slab, metasomatised by fluids released from the slab. The process could be more intensive acting jointly with hot spot.

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Collomorph Calcite in Hydrothermal Veinlets from Culmian Greywackes: Possible Relationships to Genesis, Fluid Flow and their Bacterial Content

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The collomorph calcites were found in the Culmian rocks of the Nízký Jeseník Upland, near Jakubčovice and Hrabůvka villages (Kučera, 2002). The origin of these collomorph aggregates can theoretically correspond to process of microbial precipitation of calcite.

The conditions of origin and features of these aggregates have been, therefore, studied, and main emphasis was put there on tectonic structures, previous mineral generations, mineral, chemical and isotope compositions of carbonates and ore minerals, as well as fluid inclusions or cement microstratigraphy, both seen using the cathodoluminescence and fluorescence microscopic techniques.

The calcite veinlets with collomorphs, 0.1–5 cm thick, were sampled on lower two levels of Jakubčovice Quarry. They filled fissured greywackes in many directions, but they are rare in shales. The cemented structures contain small angular clasts of greywackes, with no features of any younger deformation. Many collomorphs cover the previous hydrothermal generations, which consist of crystals. The typical plan of these fills have preferred direction NNE-SSW and WNW-ESE, which characterize the majority of post-Variscan hydrothermal swarms in eastern part of Culmian outcrops.

The collomorphs are calcite-dominated, and they form veinlets, coatings and thick bothryoid crusts. A part of them have nearly a "tufa" -appearance. Accessoric pyrite and marcasite (both determined in reflected light) form thin and alternating lamellar to patchy intergrowths within framboidal, coating or cauliflower-aggregates, which are smaller than 3 mm. The relevant calcites yield typical contents of 0.12 wt.% Mn, 0.24 wt.% Fe and 1.3 wt.% Mg. These contents of manganese and iron are four to six times smaller in comparison with averages on other post-Variscan calcites (Kučera 2002), but magnesium contents are much higher than these referenced values (×4).

The C and O stable isotope compositions of collomorph calcites are characterized by $\delta^{13}C$ values −27.6 to −48.5 ‰ and $\delta^{18}O$ values −4.2 to −6.3 ‰ PDB. As a proxy to original composition of fluids there was used an equation by O'Neil et al. (1969), for temperature 50 °C. The model isotope composition of "collomorph-precipitating" fluids corresponds to values $\delta^{18}O$ ~+0.35 to +2.5 ‰ SMOW. Using the equation according to Deines et al. (1974), the same temperature level 50 °C corresponds to $\delta^{13}C$ −29.3 to −50.2 ‰ PDB (if source is HCO_3).

The closely preceding transparent calcite crystals (Jakubčovice Q., 2nd level) contain rare and irregularly spaced, one-phase spherical inclusions (size 2–15 μm). Thus, the relevant temperature can be easy kept <50 °C. Approximately 10–20 thin growth bands per 1 mm were observed using the CL method. The intensity/color have strongest variations – from black to bright orange (CL) – that suggest great fluctuations in rock microenvironments.

According to $\delta^{18}O$ values (and other above mentioned indications), the mineralisation at crystalline-collomorph transition may correspond to fluids, which originated from marine water of Carpathian Foredeep. These saline (and possibly methane-bearing) fluids leached the Paleozoic host rocks. The presence of collomorph calcite, bothryoid structures, framboids of Fe-sulfides, as well as still "very light" carbon isotope compositions of carbonates (in spite of leaching of host rocks) suggest, that late generations in these veinlets could be bacterial precipitates, particularly, if related temperatures were < 50°C. The conditions of this type are realizable for Miocene ages.

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Syngenetic Deformation Structures in Carboniferous Turbidites in the Basement of the Fore-Sudetic Homocline – an Example from Well Marcinki IG-1

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Well Marcinki IG-1, drilled in the 1960's, is located in the southern part of the Fore-Sudetic homocline, near to Ostrzeszów. Its aim was prospecting for hydrocarbons in Carboniferous clastic succession underlying the homocline. The Carboniferous was drilled between 1715 m and 4237 m (terminal depth). The drilled interval of more than 2500 m in length is, however, not a depositional thickness, since in places the sequence was found to be tectonically duplicated by folding and thrusting. The cored intervals did not exceed 30 percent of the length of the Carboniferous section in this well. The coring was not uniform along the section, with the fully cored (100 percent) interval below the depth of 3536 m.

The Carboniferous of the Fore-Sudetic homocline is a relatively homogeneous clastic sedimentary complex. Based on textural diversity, this complex comprises rocks of three facies groups: (1) coarse-grained facies, (2) medium-grained facies and (3) fine-grained facies rocks. The structural diversity is the basis for a more elaborated division of these rocks, shown in Table 1. The distinguished lithofacies can be grouped into three facies associations, referred to as the turbidites (1), gravity flow deposits (2) and pelagites and hemipelagites (3).

The turbidite association comprises sediments of lithofacies F, G and E, partly also D (see Table 1), thus represented mostly by fine-grained (F and G) and, subordinately, sandy (E and D) turbidites. The gravity flow sediment association corresponds mostly to facies B1, B2, C and, probably partly also D (Tab. 1), interpreted here as products of variable gravity flows, ranging from collisional flows (B1; possibly partly represented by fluxoturbidites), to cohesive flows (B2, C) and to fluidized sediment flows (D?). The latter case is, however, of low probablity, since it requires high inclination of a palaeoslope (ca 30°). The pelagic/hemipelagic association includes only claystones of lithofacies H (Table 1), interpreted as resulting from quiet sedimentation of finest-fraction material from suspension. The distinguished associations point to deposition in an environment of submarine fans. In this environment, in normal conditions, turbidity currents were common, leading to deposition of turbidites. Stable conditions of turbiditic sedimentation changed periodically. The increase in environmental activity reflected by increased material supply, including coarse-grained material, was associated with the occurrence of gravity flow phenomena. The activity increase was also associated with intense erosion and sedimentation of eroded material. The result of a temporary quiescence of the environment was, in turn, a deposition of clayey material from suspension.

In clastic deposits drilled in well Marcinki IG-1 encountered were geometrically and genetically variable syngenetic deformational structures. The syngenetic deformational structures are understood here as distortions of internal geometry, structures, bed boundaries etc., that formed during the sedimentation or at an early phase of diagenesis (Gradziński et al., 1986, Allen, 1984). The most important classification criteria for distinguishing these structures are their geometric features, deformation kinematics as well as the origin of parental stresses. Based on the latter criterion, Allen (1984) distinguished several groups of deformation structures related to:

- gravitationally unstable density bedding
- non-uniform sediment load
- slope-related gravity effects.

A direct reason for the deformation is often also an abrupt expulsion of pore waters (e.g. due to a seismic shock) or an effect of living organisms on fresh sediment.

Deformational structures in well Marcinki IG-1 are concentrated mostly in fine-grained facies rocks (facies F, G, H) and are less frequent in medium- (D,E) and coarse-grained facies (B1, B2, C) rocks. The most common are deformation structures due to gravitationally unstable density bedding. The deformations of load-cast type were consolidated at various stages of development and, hence, they are geometrically variable, ranging from small distortions of sole surfaces, to drop structures deeply penetrating the substratum. The load casts are related not only to sandy-mudstone heteroliths (lithofacies F), but occur, as well in sandstone facies rocks (lithofacies D and E). Similarly, single pebbles sunken in underlying mud, can also be classed