PŮVODNÍ PRÁCE/ORIGINAL PAPER

Tonstein sloje 674 spodních sušských vrstev karvinského souvrství (česká část hornoslezské pánve)

Coal tonstein in the No. 674 Seam of the Lower Suchá Member (Karviná Formation, Czech part of the Upper Silesian Basin)

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Abstract

The paper presents results of a research on the coal tonstein (tuff) from the Lower Suchá Member of the Karviná Formation (Late Namurian, Mississippian). Coal tonstein in the Coal No. 674 was first reported in 1992 from seven mine boreholes. New occurences are described from the boreholes and mine galleries in the A. Zápotocký (Lazy) and ČSA mines. Investigated tonstein forms a layer 0.X to 3.5 cm thick. Essential constitutents of the rock are kaolinite (cca 70%) and illite-muscovite (cca 10%), while quartz, biotite, mineral of the chlorite group, and plagioclase are present is subordinate amounts (each < 5%). Kaolinite shows crystallinity index 0.85, meaning relatively high degree of crystallization. Presence of another kaolinite phase with higher structural disorder (halloysite-7Å) is quite possible. Platy kaolinite aggregates showing perfect cleavage planes in the backscattered electron images frequently contain lamellas enriched in Mg, Fe, Ti and sometimes in K, should be considered kaolinite pseudomorphs after biotite. Alteration of biotite to kaolinite was not straightforward but led also sometimes to illite-muscovite or rarely to the mineral of the chlorite group. Unaltered to partially altered biotite is present mostly in distinct laminas close to the base of the tonstein. Accessory minerals include magmatic zircon and minerals with the TiO_2 composition (anatase?), low-temperature hydrothermal chalcopyrite, galena and pyrite. Presence of weakly zoned Mg-rich siderite is connected with diagenetic processes. Uncertain is a position of REE±Al phosphates, possibly monazite-(Ce), rhabdophane-(Ce), florencite-(Ce), and florencite-(La). Their source material is possibly of volcanic origin, but it was affected by diagenesis. Very small size of their grains (< 4 μm) did not allowed wavelength-dispersive analysis. According to a classification investigated tonstein belongs to a group of pseudomorphous or transitional tonsteins. On the other hand, it lacks well-preserved coalified plant remains and fine-grained matrix is subordinate. Both pseudomorphous and transitional coal tonsteins were not previously described from the Karviná Formation. The tonstein of the Coal 674 could be used as a correlation marker and has a potential for radioisotopic U-Pb dating.

Key words: *Upper Silesian Basin, Late Carboniferous, tonstein, petrology, mineralogy*
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