

Accessory minerals in tonstein from coal seam 713 in the north part of the Upper Silesian Coal Basin (Poland)

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In Poland tonsteins occur in the Upper Silesian Coal Basin (USCB), as they do in many other coal basins in the world. In monotonously developed Carboniferous deposits, they serve as petrographic benchmarks and are used to correlate coal beds. Therefore, every report on tonsteins is followed with interest by ore deposit geologists.

This paper presents the results of mineralogical investigations of tonstein from coal seam 713 occurring in the western part of the USCB, with particular emphasis on accessory minerals.

Mineral constituents were identified by microscopic observation in transmitted and reflected light with phase identification using X-ray diffraction (XRD) techniques and determination of chemical composition of some grains within microareas using EPMA. Investigations have shown that tonstein underwent kaolinitization and carbonatization. Mineral composition included quartz (pyroclastic and terrigenous), biotite, potassium feldspar, plagioclases, volcanic glass and rock clasts. The accessory minerals that were found unaffected by kaolinitization and carbonatization included barite, monazite, apatite, pyrite, zircon, rutile and manganese oxides. The individual minerals contained the following admixtures: (i) barite - Ca, (ii) monazite – Sm, Ga and Cd, (iii) apatite – Na, occasionally SO₃, Mg, (iv) pyrite - Co, Cu, Pb, Zn, occasionally Ag, Au and Ni, (v) zircon – Sc and Ce, (vi) rutile – Cr, (vii) manganese oxides – Al.