Differences in paleofire conditions of coal seam 505 between the northern- and southern parts of the mine field of the Jastrzębie Coal Mine, Upper Silesian Coal Basin, Poland

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The causes of the thinning of the coal seam 505 in the Jastrzębie Coal Mine, Upper Silesian Coal Basin, Poland, and the relevance of differences in paleofire conditions were determined on the basis of XRD, SEM-EDS, Raman spectroscopy, GC-MS, XRF, RLOM and palynology. Samples of wall rock adjacent to the seam were collected from the northern- and southern parts of the mine field.

Organic matter present in all samples is dominated by vitrinite- and inertinite maceral groups. Vitrinite is mostly represented by typically cracked collotelinite and vitrodetrinite. Inertinite is present as fusinite, semifusinite and inertodetrinite whereas macrinite and micrinite are rare. In samples from the southern part of the field mine pyrolytic carbon represents a new form of organic matter.

Samples from both locations are characterized by microflorystic contents that are badly preserved. Miospores and other organic particles (mainly tracheids) are highly carbonized due to heating. Traces of corrosion are also common on miospores. Nevertheless, some taxa can be recognized to genus level at least. Minerals present, i.e., hematite, tridimite, anatase, hydroxylapatite and alunite, are indicative of moderate heating.

Extracts of all samples contain the same wide range of biomarkers, e.g., *n*-alkanes, alkylcyclohexanes, acyclic isoprenoids (pristane and phytane), steranes, tri- and pentacyclic triterpanes. However, distributions of a given compound differ significantly. Rocks collected from the northern- and southern parts of the mine field reveal differences in heating time and oxygen access. In the southern part of the field, seam 505 burned quickly with abundant oxygen access. The northern part the seam pyrolyzed for an extended time under conditions of limited oxygen access.

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