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Structural, microtextural and Raman spectroscopic characterization of carbonaceous particles accumulated in peat bogs of the Bohemian Massif

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The ombrotrophic peat-bog gives us a large amount of possibilities to study the effect of human activity to the quality of the Earth atmosphere. Receiving all substances via the atmospheric deposition it becomes an archive of the atmospheric evolution. The presence and the character of carbonaceous particles (CP) sampled in the frame of individual layers of peat bogs was examined using Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM) and Raman microspectroscopy (RMS). SEM permitted to classify carbonaceous particles with respect to their more or less spheric character. TEM permits to visualise microtextural features of the carbonaceous matter including the arrangement of basic structural units (BSU). Frequent circular catalytic particles contain graphene layers, without however the perfect triperiodic atomic arrangement, characteristic for graphite. Obtained Raman spectra correspond generally to disordered carbon. First results indicate that applying SEM, TEM and RMS to study CP it is possible to assess following information: 1. the original fossil fuel type, 2. combustion peak temperature, 3. possible non-atmospheric origin and 4. potential alteration of the carbonaceous residue due to weathering.