SOLID BITUMENS FROM THE VOYA DEPOSIT

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The object of study was the Voya deposit of bituminous quartzose sandstones 4.5km westward from settlement Ust-Voya on the Pechora river in the Republic of Komi, Russia.We studied solid bitumens from the sandstones of the major horizon from the Voya quarry. Fully soluble bitumens were extracted from the hosting sandstone with chloroform in Soxlet apparatus. Partly soluble bitumens were extracted mechanically. Carbon, hydrogen, sulfur, nitrogen and oxygen contents were determined by elementary analysis. The bitumens were also studied by infrared (IR) spectroscopy and electron paramagnetic resonance (EPR). Microscopic images of the fracture were generated on JSM-6400 electron microscope with LINK microprobe attachment. Chromatographic mass spectrometry of the saturated fraction of the chloroform-soluble bitumens was done using Shimadzu QP5050 instrument.The solid bitumens cementing the Voya sandstones have been found to be inhomogeneous. They essentially occur as asphaltites, however, there are younger generations represented by asphalts. Kerites were occasionally observed. All of the bitumens are naphthides, i.e. products of oil transformation.Bitumens of the Voya deposit is another example supporting the empirical observation that a relation exists between bitumen composition and concentration. It has been found that more oxidized and degraded bitumens occur in higher concentrations in the rock which is an expected consequence of the mechanism of bitumen formation.Vanadyl-porphiryn complexes, micron iron-nickel inclusions, unoxidized iron and native sulfur have been found in the Voya bitumens for the first time.