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Organic Geochemistry of Oltu Gemstone Coal, Erzurum (NE Turkey)

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The Oltu Gemstone, also known as Black Amber, is a type of coal that has bright, completely homogenous and black colored characteristics. The Oltu Gemstone occurrences are located around the Dutlu Village in the northern Oltu (Erzurum, NE Turkey). The Oltu Gemstone levels are located within the sequence composed of sandstone, marl, siltstone and claystone alternation with lens-shaped (max. 0.50 m thickness and a few meters length). Operation is being carried out in small underground mine by local private company.

The TOC and HI values vary from 70.01 to 78.56 % wt. and 357 to 379 mg HC/gr rock, respectively. The pyrolysis (Rock-Eval) data indicate that the Oltu Gemstone samples consist of Type II kerogen. T_{max} values are between 417 and 436^{o}C. In gas chromatograms of samples, less amount of n-alkanes and isoprenoids were recorded.

Tricyclic terpanes contents of Oltu Gemstone samples are of lower than hopanes and C_{30} hopane is dominant compound in m/z 191 mass chromatogram. C_{31} homohopanes are dominant over the others and homohopane distributions decrease towards the higher members in the m/z 191 mass chromatograms of the Oltu Gemstone samples. Moratane/hopane, Ts/(Ts+Tm) and C_{31} homohopane/C_{30} hopane ratios of samples are very low. In m/z 217 mass chromatograms, the pregnanes are recorded in high amount and diasterane concentrations are lower than those of steranes. (20S+20R) and $\beta\beta/(\beta\beta + \alpha\alpha)$ sterane ratios are 0.35-0.24 and 0.24-0.16, respectively. 22S/(22S+22R) homohopane ratios are between 0.56 and 0.62, and these ratios indicate that homohopane isomerization reached equilibrium.

C_{27} and C_{28} triaromatic (TA) steranes are dominant component, and C_{20} and C_{21} TA steranes were recorded in lower/higher amount for different samples. In m/z 253 mass chromatograms, C_{21} and C_{22} monoaromatic (MA) steranes are recorded in lower amount than long-chain MA steranes, and C_{28} and C_{29} MA steranes are dominant compounds. In m/z 178 and 192 mass chromatograms, phenanthrenes (P) are dominant over alkylphenanthrenes (MP) and, 9MP and 1MP were recorded in higher amount than the other MPs (MPI-1; MPI-2= 0.35-0.34; 0.41-0.42, respectively). In the m/z 184 and 198 mass chromatograms, dibenzothiophene (DBT) concentrations are higher alkyldibenzothiophene (MDBT) and 2MDBT are dominant peak than the other MDBTs (4MDBT$>$ 1MDBT). The P contents are in higher amount than DBT contents and P/DBT ratios of the Oltu Gemstone samples were estimated to be between 3.04 and 5.72.