

**ORGANIC GEOCHEMISTRY OF A POTENTIAL SOURCE ROCK OF
CRETACEOUS AND TERTIARY AGES IN THE INDIGIRO-ZIRYANSK BASIN
(EASTERN SIBERIA)**

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Aliphatic fractions obtained from twenty four samples of clay and shale taken from outcrops of Cretaceous and Tertiary cross section in the Indigiro-Ziryansk basin were analyzed by gas chromatography-mass spectrometry. Gas chromatographic-mass spectrometric (GC-MS) determination of saturated hydrocarbons was carried out with a system that featured a 6890 series gas chromatograph interfaced to an Agilent 5973N high performance mass-selective detector. The chromatograph was equipped with a fused silica capillary column 30 m in length and 0.25 mm in diameter with a bonded HP-5MS phase. The carrier gas was helium used at a flow rate of 1 ml/min.

The distribution of n-alkanes in organic matter of the Tertiary clay is generally characterized by a predominance of odd-carbon numbered homologues of high molecular weight, maximising at n-C₂₇, and/or n-C₂₉. These hydrocarbons are considered to be derived from cuticular waxes of terrestrial plants. The pristane/phytane ratios of 1,1 – 1,4. GC-MS data obtained on the saturated fraction reveal of relative abundance of the diterpanes: 19-norisopimarane, 18-norabietane, pimarane and abietane. Norisopimarane and norabietane have the molecular ion at m/z = 262 (C₁₉ tricyclic hydrocarbons) and intensive fragment ion at m/z = 109 from rupture of the B ring. Pimarane and abietane (C₂₀) have the m/z = 163 and m/z = 123 fragment ions and molecular ion at m/z = 276. But main (100%) fragment ions for norisopimarane and pimarane are M⁺-29 from loss the ethyl groups.

The mass-chromatograms by m/z = 191 (Fig.1) indicate the presence of significant amounts of “biological” 17β(H), 21β(H) hopanes. Five oleanene isomers have been tentatively identified based upon comparison of individual mass-spectra and published data. In the sediment as well as in laboratory simulation experiments, olean-12-ene further isomerises to olean-13(18)-ene and olean-18-ene, the latter of which may be the direct precursor of 18β(H)- and 18α(H)-oleanane found in sediments containing more mature organic matter and in crude oils (Ten Haven and Rullkötter J.,1988).

In contrast, the terpane distribution of the Cretaceous shale has low amounts of diterpanes. The cheilanthanes, oleanenes and oleanane are absent. The composition of

linear alkanes is dominated by the C₂₀-C₂₃ homologues, without any remarkable odd/even preference. The pristane/phytane ratios of 0,9 – 1,6.

The Cretaceous and Tertiary clay and shale from the outcrops are relatively organic rich (TOC>3%) but degree of maturity are difference. The random reflectance of vitrinites obtained for the Tertiary coal inclusions seams varies from 0.35 to 0.46% and till 65% in the Cretaceous shale.

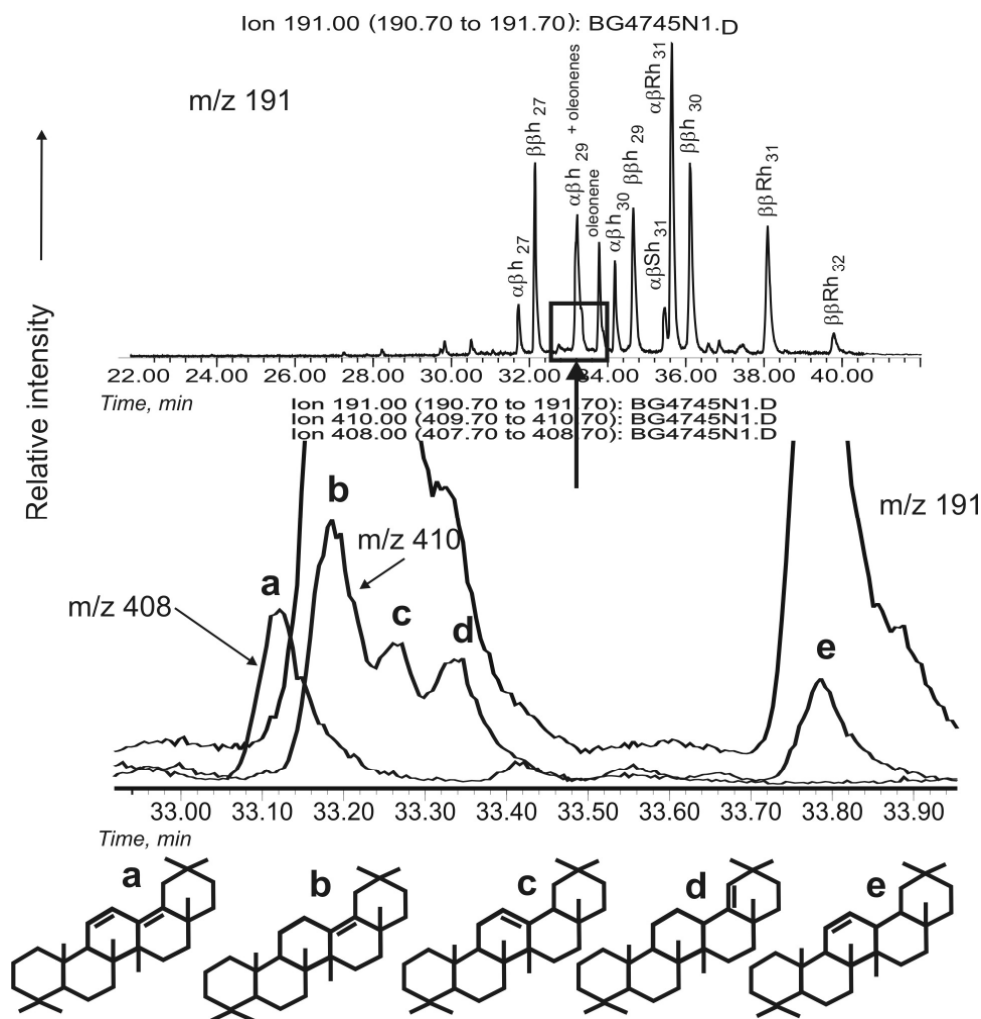


Figure 1. Mass chromatograms (m/z= 191 and m/z= 191, 408 and 410) showing hopane and oleanene isomers distribution in saturated fraction in the .extract from Tertiary clay.

The exploration work on petroleum and gas in the Indigiro-Ziryansk basin are spent in very small volumes and while of essential results not distances. We hope, that the received geochemical results will be used at statement of new researches in near future.

REFERENCES

Ten Haven and Rullkötter J. (1988) The diagenetic fate of taraxer-14-ene and oleanene isomers. *Geochimica et Cosmochimica Acta* , **52**, 2543-2548.