

**ORGANIC GEOCHEMISTRY OF SEDIMENTARY ROCKS
IN PALEOZOIC COMPLEXES OF WEST SIBERIA**

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This work is aiming to study the peculiarities of geochemistry of OM of sedimentary rocks from West Siberian Paleozoic complexes. The OM studies was done on the collection of samples (550) from various lithological types (limestones, dolomites, marls, mudstones, siltstones and sandstones) of Paleozoic complex (mainly, Devonian and Cambrian). The age of Paleozoic deposits was determined by IPGG SB RAS specialists. There were studied regularities in the distribution of organic carbon and autochthonous bitumoids (chloroform-extractable bitumens). 187 autochthonous bitumoids were studied with the use of a wide range of physical and chemical methods of study (gas-liquid chromatography, gas chromatography-mass-spectrometry). OM maturation at the top of Paleozoic deposits varies within MK₂–AK₃ gradation and higher ($R_{vt}^0 = 0.85-6.0\%$). According to the pyrolysis data in most of samples H (hydrogen) index values constitute 50 HC/g C_{org}.

Organic carbon content varies, on the whole, within a wide range from a hundredth part of a percent up to 5% per rock. In most of samples the concentration of C_{org} falls within the span of 0.0 – 0.5%. Concentration of autochthonous bitumoids varies from hundredth to tenth parts of a percent (most spread are 0.00-0.01% values). Among marls, siltstones and mudstones there are some separate samples with higher (up to 0.16%) bitumoid content. Resins prevail in the group content composition of bitumoids, while HC content level constitutes 30-35%. Among hydrocarbons the saturated structures 1.1-5.5 times higher than in aromatic structures in all bitumoids. The content of asphaltene components varies widely from traces up to 25% per bitumoid.

In the saturated fraction of butumoids there was studied in details the individual content composition of normal alkanes (C₁₁–C₃₉) and aliphatic isoprenoids (i-C₁₃-i-C₂₅), as well as of cyclic HC from sterane (C₂₁, C₂₂, C₂₇-C₃₀) and terpane (C₁₉-C₃₅) series. According to HC-markers distribution the bitumoids were divided into two groups. Biomarkers' parameters values (ratios: n-C₂₇/n-C₁₇<0.5, Pr/Ph<1.5, C₂₉/C₂₇ steranes< or= 1, cheilantanes $2(C_{19}+C_{20})/\sum C_i$ (i=23, 24, 25, 26)<1, with high concentrations of pregnanes and tricyclanes) for the first group of bitumoids prove the OM to be marine, which is confirmed by ¹²C and ¹³C carbon isotopes ratio in OM (-35)-(-29)⁰/₀₀. In the second group the biomarkers' parameters

values (ratios: $n\text{-C}_{27}/n\text{-C}_{17}>1$, $\text{Pr}/\text{Ph}<1.5$, $\text{C}_{29}/\text{C}_{27}$ steranes >1 , cheilantanes $2(\text{C}_{19}+\text{C}_{20})/\sum\text{C}_i$ ($i=23, 24, 25, 26$) <1.5 , with low concentrations of pregnanes and tricyclanes) signify the influx of terristrial OM, which is proved by isotopic content of carbon $(-30)\text{--}(-28)\text{‰}$.

So, in terms of HC-biomarkers content there can be discriminated some biogeochemical facies in Paleozoic complexes from West Siberia, which was conditioned by a complicated relations of rifting carbonate, domanikite pelagian, and volcanogenic sedimentations in the Paleozoic basin, which was contributed by counter-current flows of the terristrial material with various content composition, going from both pre-platform island and from the active volcanic arches. High level of catagenesis in Paleozoic complexes in the biggest part of the West Siberian megabasin area ($R_{vt}^0 > 3.0\%$), and as a result, OM generation potential of these plays being in fact completely exhausted (in the zone of dominating liquid HC generation there are only 8% of the studied samples), which makes it hardly possible that they contain any large syngenetic HC pools preserved. Anyway, the presence of HC-markers in Paleozoic naphthides signify that there exist zones, where paleo-thermo-baric in-place conditions did not cause complete destruction of HC accumulations. So, Paleozoic sedimentary strata less than 4.0 km deep are located in the major zone of oil generation in the biggest part of the Nyurolka basin ($R_{vt}^0 = 0.85\text{--}1.20\%$), and OM proves to be able to generate oily HC. These deposits produced variously intense influxes of condensate gas and light oils, and drilling was accompanied by numerous oil and gas seepages. Gas HC influxes were observable in the formations with $\text{MK}_3^1 - \text{AK}_1$ catagenic gradates ($R_{vt}^0 = 1.15\text{--}2.50\%$) in various areas of the region. In highly maturated Paleozoic deposits ($R_{vt}^0 > 3.0\%$) the possibility of preserved syngenetic HC pools appears to be excluded.