

Organic matter in the history of Pliocene-Quaternary sedimentation in the Chukchi sea (shallow drilling results)

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The material of the study is based on samples collected in 2006 in the southern part of the Russian sector of the Chukchi Sea on board the sea tug "Shuya" [1]. The material for the study were samples taken along the core of the borehole One (Long Strait, on the south side of Wrangel Island). Analytical procedure included the determination of elementary (TOC, Ccarb), group and molecular composition of dispersed organic matter soluble part using preparative liquid chromatography method and GC-MS analysis (hydrocarbon markers (alkanes, arenes, cyclanes)) with the Agilent Technologies 6850/5973 GC/MSD System.

Analysis of changes in the content of TOC and Ccarb in sediments allowed to make conclusions about the changing of marine (QIV) by coastal-continental (QIII) and shallow continental (N2) sedimentation environment (changing of TOC and Ccarb content down the core) and also a possible climatic optimum with significant inflow of humic organic matter (OM). Differences in the process of formation the organic component of the bottom sediments of the upper and lower parts of the studied section also shows the distribution of hydrocarbons (HC). It is necessary to take into account the variety of factors that determine the composition of the OM of sediment and the statistical nature of the geochemical parameters. We can talk only about the prevalence of certain components. For example, the dominant role of humic material in the OM of studied section may be illustrated by the n-alkanes ratio (C17/C29). In the lower part of the core were found molecular biomarkers that are evidence of higher terrestrial vegetation (retene, cadalene, Olean-18-ene, D-Friedoolean-14-ene). This is consistent with paleomagnetic data, the micro fauna analysis and spore-pollen spectrum studies [1].

References

1. Gusev E.A. et. al. Stratigraphy of Late Cenozoic sediments of the western Chukchi Sea: new results from shallow drilling and seismic-reflection profiling / Global and Planetary Change. – 2009.–Vol. 68.– Issues 1–2. – P.115–131.