Organic matter in ferromanganese nodules of the Kara Sea, Arctic region

N. SHULGA, A. DROZDOVA AND V. PERESYPKIN

P.P. Shirshov Institute of Oceanology, RAS
Nakhimovsky prt. 36, Moscow, Russia, 117997,
(nash.ocean@gmail.com)

Marine ferromanganese nodules have been investigated on various aspects, such as elemental composition, mineralogy and microstructure, since they were discovered during the Challenger Expedition in 1872–1876. Despite the numerous studies, there is no a consensus within the scientific community on the source and precipitation mechanism of the ore material in marine manganese nodules. Two possible options would be (1) chemical oxidation (abiotic origin) and (2) deposition of the metals through microbial enzymatic processes (biogenic origin) [1,2]. Although both of them are widely discussed in literature, the role of organic matter during the formation of nodules is not yet clear.

A detailed investigation of organic matter (OM) of nodules, in our view, could clarify this situation; however such data are quite scanty. Today there is no information about the contribution of OM in the nodules of the Arctic seas and its transformation into them.

We present here the molecular and group composition of n-alkane hydrocarbons and PAH analyzed in the samples of ferromanganese nodules collected in the Kara Sea during the 125th cruise of R/V "Professor Shtockman" in October 2013. All solvent extracts from the samples have been studied by gas chromatography/ mass-spectrometry (GC/MS) technique. Investigation of hydrocarbon biomarkers allows revealing main sources and features of the geological and biogeochemical transformation of organic matter.

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[1] Baturin G.N., 1986. 327 p. [2] Nayak B. *et al* // *J. of As. Earth Sci,* 2013. № **73**. P. 296-305.