Distribution of n-alkanes in sediments of the Baikal Lake

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The purpose of this abstract is to present results of initial investigation related to n-alkanes distribution in the Baikal Lake sediments - the one of the world deepest and freshwater lake. The samples were collected from two expeditions in 2008 and 2009 by using deep manned submersibles Mir-1 and Mir-2. Concentration of n-alkanes in samples varies from 0.65 to 13.59 mkg/g of an air-dry deposit. The following three types of organic matter (OM) distribution in the sediments were revealed: planktonogenic (I), mixed (II) and terrigenous (III) origin (Fig.1).

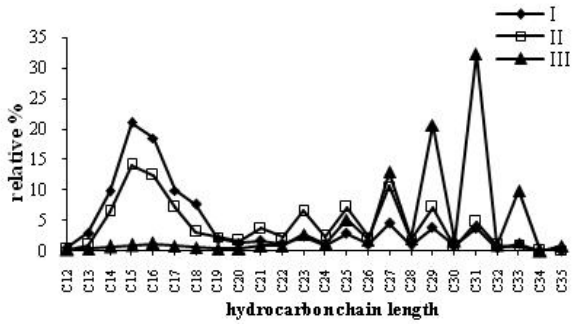

Figure 1: Relative n-alkanes distribution in samples.

Distribution of n-alkanes in type I is characterized by oxidizing processes, low-molecular n-alkane homologies predominance ($\sum C_{12}+C_{22}/\sum C_{23}+C_{35}$=1.41÷3.39) and high even/odd index (CPI=1.31÷1.63). Type II is represented closely equal parts of planktonogenic and terrigenous OM (CPI=1.19÷2.44, Pr/Phy=0.84÷1.36). Distribution of n-alkanes in type III is defined by the values of Pr/Phy=0.63÷1.43, CPI=3.56÷7.56 and high quantity of $\sum C_{12}+C_{22}/\sum C_{23}+C_{35}$=0.11÷0.30.

Analysis of n-alkanes distribution and presence a relatively low content of naphtene hydrocarbons in the analyzed fraction (presence of the 'hump') indicates current insignificant microbial transformation of organic matter in sediments.

Fe-Ti oxide ores with P-bearing minerals of the Fedorivka (Ukraine) and Suwalki-Sejny (Poland) Precambrian AMCG massifs

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Fe-Ti-P-rich rocks (FTP) are mostly related to Proterozoic massif-type anorthosites. Two large anorthosite-mangerite-charnockite granite (AMCG) complexes – Korosten (W Ukraine) and Suwalki –Sejny massif (NE Poland) are well known Fe-Ti-P potential deposits related to two different crustal segments e.g. Sarmatia and Fennoscandia. Common feature of these intrusions is jotunitic nature of chilled margins. Occurring in NE Poland at the depth of nearly 1 km beneath the Phanerozoic sedimentary cover the Suwalki and Sejny anorthosite massifs represent a Proterozoic AMCG suite of plutonism ca 1.5 Ga old [1]. Jotunite - orthopyroxene monzodiorite rocks of high Fe, Ti and P contents form a fine-grained dikes and veins within anorthosite and norite bodies. These rocks have a very high content of iron (from 16.3 to 18.8% Fe_2O_3), titanium (from 2.26 to 3.45% TiO_2) and phosphorus (from 0.18 to 1.2% P_2O_5), and low Mg/Fe value (# mg = 0.22). The *REE* distributions for the Suwałki and Sejny jotunites were medium differentiated with $(La/Yb)_{CN}$ ca 10 and without Eu anomaly. The apatite-ore rocks with variable but low contents of silicate minerals called *nelsonites* have been found in the north-west part of the Suwałki massif (Łopuchowo borehole). Fine-grained nelsonite veins are enriched in Cr (0.18-0.22%), Ni (0.08-0.17%), Cu (0.15-0.26%), Co (80-180 ppm) i REE (0.55%) in comparison to whole rock analyses of anorthosite, norite and host diorite. The main REE-bearing mineral-phase of nelsonite is an apatite. The La–ICP-MS trace element analysis reveal a high Y+ REE content in fluorapatite up to 2 700ppm of Y and 2 000 ppm of Ce. Accessory REE-rich phase is also Ce-Nd allanite.

The rocks of Fedorivka gabbro layered intrusion, part of 1.8-1.73 Korosten AMCG pluton, represents typical cumulate textured body with conspicuous mineral lamination. All mafic samples tend to define linear trends, extending from plagioclase pole to a mafic pole. Mafic pole composition gives the maximum possible enrichment in FTP to be found in whole intrusions up to 30 % $Fe_2O_{3T,}$ 8.8 % TiO_2 and 4.5 % P_2O_5

[1] Wiszniewska *et al*. (2002) *Terra Nova* **14**(6), 451–461.