P356-TH

COMPOSITIONAL FEATURES OF AROMATIC HYDROCARBONS IN OILS FROM PALEOZOIC DEPOSITS IN THE SOUTH-EAST OF WEST SIBERIA

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Compositional features of saturated cyclic hydrocarbons-biomarkers of sterane and terpane types in Paleozoic oils of West Siberia are comprehensively described in (Kostyreva T.A., 2005). Though aromatic hydrocarbons, which are considered as carriers of information on the effect of catagenetic factors on organic matter transformations (Radke M., 1987, Smith J.W. *et al.*, 1995) remained out of examination.

In the present work we have studied individual compositions of alkyl derivatives of bi- and triaromatic hydrocarbons in 22 crude oils recovered from Paleozoic deposits, Nyurolskaya facial zone located in the southeast of West-Siberian oil-and-gas-bearing province. The fractions of bi- and triaromatic hydrocarbons were isolated by column liquid-adsorption chromatography and analyzed by gas-liquid chromatography and chromato-mass spectrometry.

In most oils maximum in n-alkane distribution fell to homologues C_{10}-C_{15}. Pr/Ph values varied from 1.1 to 1.7 and those of C_{17}/C_{27} ratio ranged from 3 to 12. Such values of these parameters were due to coastal depositional environment. In crude oils recovered from Severo-Kalinovoye oil field and in four crude oils from Gerasimovskoye oil field C_{17}/C_{27} values ranged from 1.7 to 2.6, while those of $\Sigma(C_{10}$-$C_{20})/\Sigma$ (C_{21}-C_{36}) ratios in the same oils varied from 0.8 to 2.3. The data evidenced that organic matter of a mixed type was involved in the formation of these crude oils.

The isomers of methyl-(MN), di-(DMN) and trimethyl naphthalenes (TMN) were identified in the fraction of cyclic biaromatic hydrocarbons. For most crude oils (Fig. 1, group I), which occurred at the depth of 2722 –3035 m, the ratio of MN : DMN : TMN isomers was equal to 1:1.3:1.0. At the same time in crude oils recovered from Archinskoye, Kalinovoye, Severo-Kalinovoye and Shirotnoye oil fields (Fig. 1, group II), the depth of occurrence of which was 3030-3140 m, the ratio of MN : DMN : TMN isomers was equal to 1 : 1.2 : 2.9. Probably the increased content of trimethyl naphthalenes evidenced that the processes of naphthalene alkylation prevailed over isomerization, since based on the values of maturity and alkyl naphthalene compositions it was difficult to reveal essential difference in the oil samples under study.

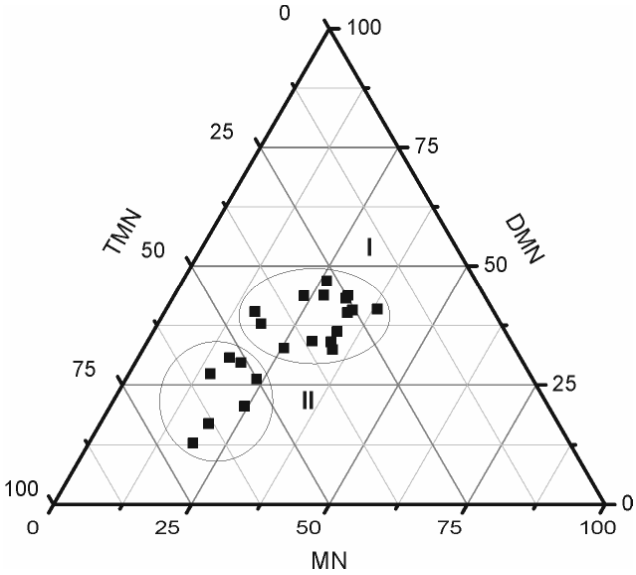

Figure1. Group composition of alkyl naphthalenes

The values of geochemical parameters calculated by alkyl naphthalene compositions and reflecting isomerization processes - MNR, DNR2 and TNR3 evidenced that according to (Stojanović K. *et al.*, 2005) one can classify such oils as the oils of average maturity.

Triarenes were determined to include methyl-, di- and trimethyl-phenanthrene isomers and anthracene isomers. The phenanthrene concentration ranged from 7.6 to 23.4 % rel. Along with phenanthrene the content of methyl-substituted phenanthrenes substantially exceeded the contents of anthracene and methyl anthracenes. The content of methyl isomers was higher than that of dimethyl- and trimethyl phenanthrenes. Similar to the values of geochemical parameters, calculated by alkyl naphthalene compositions, the values of the same parameters, calculated by MPI3, MPR1 and PAI1 alkyl triarene compositions, also indicated average degree of transformation.

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