

SATURATED AND AROMATIC HYDROCARBONS OCCURRED IN SOME CRUDE OILS OF WESTERN SIBERIA

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Hydrocarbons (HCs) as compounds resistant to a variety of conditions are ubiquitous in oils and sedimentary rocks. Analysis of these compounds allows one to receive the important information about the molecular composition of crude oils, their possible bioproducers and consequently to reconstruct the conditions of their formation or transformation in environments (Petrov *et al.*, 1994).

The composition of alkanes, steranes, hopanes and aromatic hydrocarbons has been studied in the crude oils of ten areas located in the southeastern part of Western Siberia. The oils differ in geological age of bearing strata from Paleozoic up to Lower Cretaceous. Individual HCs availability was analyzed using a GC-MS technique.

The geochemical indices based on alkane composition have revealed the majority of the investigated oils were composed by contributions of phytoplanktonic and of other algal primary OM. The increased input of the higher terrestrial plants is characteristic only for the crude oils of the following areas: Quartovaya (well 7), Kul'-Eganskaya, Prykoltogorskaya and Festival'naya. The same oils are also remarkable for increased values of Pr/Ph ratios (from 1.15 up to 1.75).

Almost every sample of the investigated crude oils contains large quantity of diasteranes, which is characteristic for oils generated in argillaceous sediments. In the crude oil extracted on the Southern Matyushkinskaya area abundance of 17 α (H),21 β (H)-30-norhopane has been found, the fact which indicates the presence of carbonate ingredient in the source rock. The same oil contains 17 α (H),21 β (H)-28,30-bisnorhopane in abundance. The last is also abundant in the oils of the Quartovaya (well 3) and Kul'-Eganskaya areas. The sources and predecessors for these hydrocarbons have not been corroborated, as yet. However, such terpanes seem to be specific as geochemical indices.

Among steranes of the majority of crude oils under study steranes with the C₂₇ structure prevail. The oils of the Quartovaya (well 7) and Prykoltogorskaya areas are distinguished by higher contents of C₂₉ sterane. The maximal percentage of γ -lypane and di-hopane is marked in the oil of the Prykoltogorskaya area. The crude oils originated from the land-derived OM are known to have higher portions of γ -lypane, oleanane and tetracyclic terpane of C₂₄ structure [1]. Amongst tricyclic aromatic steranes, cholestane C₂₆ and ergostane

C₂₇ prevail in virtually all of the studied oils, the oil of the Prykoltogorskaya area excluded; the last has another sterane distribution with stigmastane C₂₈ prevalence.

In the oils under study the predominance of aromatic hydrocarbons over alkanes lengthwise the depth of burial is registered. So, their relative concentration changes from 7.51 up to 24.59 % and then decreases up to 12.61 % in Palaeozoic oils. Monocyclic compounds prevail among aromatic hydrocarbons in all of the investigated oils.

Using Hughes' criteria (Hughes *et al.*, 1995) almost every of the studied oils has got into the group of oils depleted in sulfur and being originated in a lacustrine facies. The oils extracted on the Quartovaya (well 7), Prykoltogorskaya, Kul'-Eganskaya and Festival'naya areas are notable for oxic environmental conditions during their original OM accumulation. Low content of dibenzothiophenes and high – of dibenzofurans, is also characteristic for these oils. Dibenzofurans are well established (Pu *et al.*, 1990) [3] to originate mainly in fresh-water sedimentary environments.

Thus, the main result of the study is that the composition and distribution of both saturated and aromatic hydrocarbons are under influence of the type of initial OM and also of depositional environments. It has been found out that, mostly, the investigated oils were originated from the sapropelic OM, which was deposited in saline shallow-sea or lacustrine environments. The oils of the Prykoltogorskaya, Quartovaya, Kul'-Eganskaya, and Festival'naya areas are notable for the increased contribution of the terrestrial plants to their initial OM. The formation of the last of three oils occurred in fresh-water coastal-sea or lacustrine environments and of the Prykoltogorskaya - in alluvial deltaic ones.

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