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Analysis of Problems with Hydrocarbon and Geotoxicology

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Abstract: The paper aims to figure out what are Analysis of problems with hydrocarbon and geotoxicology. By using descriptive method for primary model, synthesis methods and process analysis and analysis of difficulties and discussion, The study of this problem point that most often conclusions have to be drawn by solving an inverse rather than a direct problem, i.e. on the basis of objective data on the content and composition of PTE in hydrocarbons, decide on the issue of possible sources of their income. The same problem is encountered in the mining geology and in all other branches of knowledge combined in the natural, and not the exact sciences.
In this section, we will consider only the primary sources of PTE accumulation in organic matter. Secondary, i.e. sources of income and accumulation of PTE hydrocarbons will be evaluated "Processes of secondary concentration of PTE by hydrocarbons during their ontogenesis", after characterizing the PTE content in oil.
Keywords: Hydrocarbon, Problems, Environment, Geotoxicological Factors.

INTRODUCTION

Significant participation in the formation of a modern understanding of the national geotoxicology was provided by two of the most authoritative scientists of the toxicologists of the Soviet military school - professor of the Military Medical Academy, chief toxicologist of the Soviet Army, Major General Nikolai Vasilyevich Savateev and a young, brilliant scientist, also a general Major and Professor of the Academy Sergey Alekseevich Kutsenko. Their friendly participation and advice in areas of environmental toxicity assessment, toxicity research methods different environments and collaboration experience are invaluable.

The paper presents related studies on hydrocarbon and Geotoxicology as well as Analysis of problems with hydrocarbon and geotoxicology.

Research Questions

Question 1: What are related studies on hydrocarbon and Geotoxicology?
Question 2: What are **Analysis of problems with hydrocarbon and geotoxicology**?

METHODOLOGY

Authors have used qualitative and analytical methods, descriptive method for primary model, synthesis and discussion methods in this paper.

We also used historical materialism method.

MAIN FINDINGS

Analysis of Problem

Among the biologically active toxic elements, the highest concentrations in hydrocarbons reach such as: vanadium, nickel, cobalt, mercury, sulfur, less often uranium and arsenic. But if the presence of hydrogen sulfide is detected in raw materials by smell almost immediately, then most other active toxicants go unnoticed. So, mercury vapor, arsenic, radioelements can be detected in a timely manner only with a special study, which emphasizes the need for not only an ordinary study of the qualitative composition of oil (gases), but also the most common toxocomponents in them. Hence the need in identifying the geological and geochemical patterns of accumulation and distribution toxoelements in natural hydrocarbons in order to timely emphasize attention, already at the stage of search and exploration, to the need for detailed analysis of the composition of hydrocarbons in certain regions for certain components.

As noted above, we do not consider the toxic components of hydrocarbons, compounds of the oil itself: benzenes, 3, 4-benz-(a)-pyrenes, etc. They, like other components crude oil, refer to the phenomena of mainly surface, obvious environmental environmental damage, i.e. to the form of defeat that is associated with any surface oil spills. They are relatively well studied and it is for them a variety of protective, control and rehabilitation measures are being developed. Not We also paid special attention to the study of sulfur content in oil and gases, since according to There is an extensive research and reference literature on these issues.

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Prevalence of PTE in rocks and hydrosphere

Since the entire ontogenesis, both OM and HC, takes place in the sedimentary environment, it is necessary characterize, at least in the shortest possible way, the main sources of PTE inflow into rocks and waters of the sedimentary cover and their distribution.

We have already noted that in various geological, geochemical and geostructural conditions there are different associations of potentially toxic elements-impurities in hydrocarbons.

Most often, three groups of elements are distinguished in oil,

- V, Ni and Co;
- Cu, Zn, Cd, Pb, Hg, As;
- Highly radioactive elements.

These three associations of elements in hydrocarbons are in good agreement with their mineralogical classification, the foundations of which were laid down by A.V. Vernadsky, A.N. Zavaritsky, V.M. Goldshmit and other researchers.

Their essence was reduced to association, according to V.M. Goldschmit, into the following groups of elements:

- Ÿsiderophiles - Fe, V, Cr, Sc, Mn, Co, Ni, Ti, inherent in basic and ultrabasic igneous rocks;
- Ÿchalcophiles - Cu, Pb, Zn, Cd, Hg, As, Jn, Se, etc. These elements are most often are found in sulfide deposits in the distribution zones of the main and ultrabasic rocks;
- ÿlithophiles are the largest group of the most common elements in the Earth, among which are Li, Be, Sr, Re and many others, most often associated with alkaline and acidic igneous rocks. To the same group of lithophile elements, one can include radioactive, also gravitating towards acidic rocks.

Elements do not obey a particularly rigid division into these groups, there are also overlap. So, Ni and Co often accompany ore occurrences not only with siderophiles, but and with chalcophiles. Moreover, the deposits richest in Ni and Co concentrations belong to the latter. But according to the prevalence of these elements, absolutely rock types with the mineral appearance of siderophiles predominate. Among lithophiles often there are other elements.

In general, the elemental composition and mineragenesis of basement rocks, sedimentary cover and reservoir fluids, incl. SW appears quite clearly. Although the more difficult geological history of the cover in the Phanerozoic, the greater the thickness and the more diverse the facies composition, the less obvious is their connection with the initial composition of the lithosphere, especially in zones of intense modern orogeny, in which sediments in various geological epochs received mineral material from different sources. Moreover, there were inevitable multiple processes of secondary changes in rock composition, especially in hypergenesis zones or subsequent hydrothermal impacts.

Out of consideration in the work remained a large group of elements included in the rare earths, and some other less common elements. This is due to the extremely low degree of knowledge of hydrocarbon raw materials and their biological properties. It is quite obvious that this is research in the near future.

As can be seen from our study, the information provided from various sources is somewhat contradictory, which is natural, given the low level of their study, but the idea of orders of magnitude of their prevalence can still be obtained.

The same table well characterizes that clays, i.e. initially the main generators of hydrocarbons, are concentrators of most of the elements we are considering in comparison with their Clarke on the bark as a whole.

Next, the primary accumulation of biotoxicants by organic matter begins with their lifetime entry into the biota and continues during the processes of dia- and catagenesis up to before the stage of generation of hydrocarbons. Correctly separate the two stages of this primary process difficult, since their intensive lifetime accumulation by biota occurs usually in an anomalous geochemical environment, and this anomaly is expressed not only in living matter, but also in the rocks, soils and waters among which she lived dying biota in favorable for its preservation reducing environment already in the form of organic matter continues sorb the same elements from the same medium. This process of unity of mass death of organic matter in an environment enriched with uranium, with the formation of oil and gas source strata, very good shown by S.G. Neruchev in his work "Uranus and life in the history of the Earth". For the considered It is important for us to assess the lifetime accumulation of toxicants by biota, since these processes continue to this day, they are still little studied.

Under lifetime accumulation of PTE by biological objects, we mean those quantities that enter the food, air, and other physiological chains, both for ensuring the functional needs of organisms, and to the detriment of them under conditions their abnormal concentrations in the environment.

Then for clarity, PTE clarks are combined in a variety of objects and environments.

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Land plants are enriched in V, Cr, Co, and Ni by an order of magnitude or more compared to terrestrial fauna. But Zn, Cd and Hg are concentrated by terrestrial animals to a greater extent than by land flora.

The accumulative capacity of PTE by the ocean fauna has too large a range of differences, but some similarity with the land fauna is still observed. V, Cr, Co, Ni, Pb and Cu are greater in plants of the ocean than in marine animals. Based on these and other data, S.G. Neruchev calculated the biota concentration coefficients of different elements relative to the hydrosphere, including potential biotoxicants. The latter is characterized by a surprisingly high biophilicity. In particular, compared with the hydrosphere in biota, Cr and Ge can be concentrated 104 times more, V and Pb 103 - 104, a Zn, Cu, Ni, As, Co, U, Hg and Ra are 102 - 103 times more than in sea waters. The biophilicity of most toxoelements is exactly the criterion forced toxicity, the possibility of which is drawn attention to.

The biological activity of natural hydrocarbons and their associated potentially toxic components-impurities.

DISCUSSION AND CONCLUSION

It should also be noted the differences in the state of knowledge of these processes. More grounded and studied the primary processes and scales of accumulation, somewhat less - secondary.

The latter, unfortunately, is objective, since the course of hydrocarbon ontogeny is predictable, and not researched process.

Therefore, most often conclusions have to be drawn by solving an inverse rather than a direct problem, i.e. on the basis of objective data on the content and composition of PTE in hydrocarbons, decide on the issue of possible sources of their income. The same problem is encountered in the mining geology and in all other branches of knowledge combined in the natural, and not the exact sciences.

In this section, we will consider only the primary sources of PTE accumulation in organic matter. Secondary, i.e. sources of income and accumulation of PTE hydrocarbons will be evaluated “Processes of secondary concentration of PTE by hydrocarbons during their ontogenesis”, after characterizing the PTE content in oil.

At present, the active development of mankind deposited in mineral resources, including the organic matter of toxicants, leads to the manifestation of negative biological activity of the dispersion products of toxoelements in the environment. Changing geochemical appearance of entire regions of the planet.

At the same time, a dilemma arises - which development scenario will we consciously choose.

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Conflicts of interest
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