Mediterranean Journal of Basic and Applied Sciences (MJBAS)
Volume 6, Issue 4, Pages 20-23, October-December 2022

Reserves of Heavy Oil and Concentrations of Toxicants in the Environment and Environmental Impacts

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DOI: https://doi.org/10.46382/MJBAS.2022.6403

Article Received: 06 August 2022 *Article Accepted: 14 October 2022* *Article Published: 14 November 2022*

ABSTRACT

The paper aims to figure out Reserves of heavy oil and concentrations of toxicants in the environment and environmental impacts.

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, The Hanford plant and the results of its activities are a good illustration of the situation that even small concentrations of toxicants in the environment can be intensively accumulated living organisms permanently living in it.

Keywords: *Reserves, Environment, Composition, Heavy oil and gas fields.*

1. INTRODUCTION

The ability to accumulate a significant mass of organic matter of various elements and its ability not only not to lose, but in some cases even to concentrate additional amounts of PTE undoubtedly plays a significant role in the formation deposits of mineral raw materials with high environmental risks during their development.

The paper presents related studies and Reserves of heavy oil and concentrations of toxicants in the environment and environmental impacts.

Research Questions

Question 1: What are related researches and Analysis of Reserves of heavy oil and concentrations of toxicants in the environment and environmental impacts?

2. 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.

3. MAIN FINDINGS

Analysis of Problem

For example, in the Western Canadian Basin, due to the presence of reserves of bituminous giants of the zone Athabasca becomes predominant heavy and super-heavy oil. In Persian and Western Siberian NGP - light and medium. International market for commercial standard calculations take "light Arabian" oil - 0.850 g/cm^3. Heavy oil occupies a special place among the oil, differing both in properties and in composition. Heavy oil is dominated

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by tar-asphaltene compounds with heavy molecular weight, consisting of complex polycyclic molecular systems, often enriched with PTE. By the early 1990s, proven reserves of heavy oil and natural bitumen in the world exceeded the reserves of conventional oil by 1.6-1.8 times. heavy oil resources concentrated in Venezuela, Canada, Russia and the USA, shown in figure 1.

Region, country	Accumulated booty	Known resources	Undiscovered resources	Final resources
North America, incl. USA	1.7 1.6	3.5 2.8	3.2 0.4	8.4 4.8
South America, incl. Venezuela (K ret = 0.15)	0.6 0.5	44.0 43.8	3.5 3.4	48.1 47.7
Zap. Europe	0.06	1.2	0.03	1.3
Middle and Middle East, incl. Iraq	1.8 1.6	5.3 3.5	4.0 3.0	11.1 8.1
Africa	0.05	0.7	0.2	0.95
The rest of Asia, Australia and Oceania	0.2	1.5	0.4	2.1

Figure 1. Recoverable resources of heavy oil, billion tons

World geological reserves of heavy hydrocarbons of all categories are estimated at 641 billion tons (4.7 trillion barrels) of oil equivalent. By 2019 proven reserves of heavy oil and natural bitumen in the world have grown. Only in the Orinoco Basin in Central America geological resources of heavy oil, bitumen and oil in oil sands are not predicted less than 600 billion tons, and in terms of reserves 177.9 billion tons. For comparison, high-viscosity oil reserves in the Russian Federation amount to 6.236 billion tons. These figures indicate the forthcoming volumes of development heavy oil.

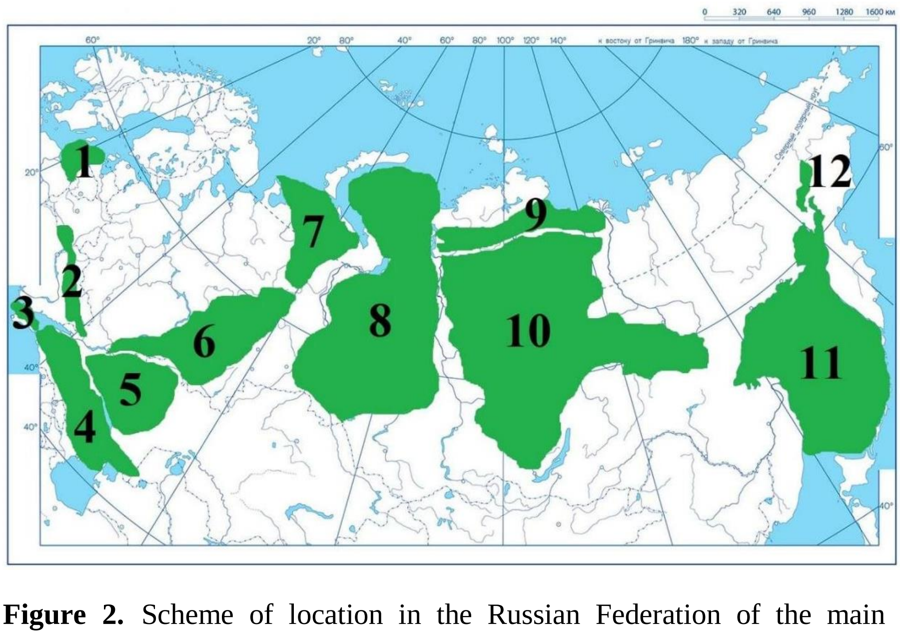

Figure 2. Scheme of location in the Russian Federation of the main deposits of heavy oil and bitumen accumulation zones: 1. Baltic; 2. Dnieper-Pripyat; 3. North Crimean; 4. North Caucasian; 5. Caspian; 6. Volga-Ural; 7. Timan-Pechora; 8. West Siberian; 9. Yenisei-Anabar; 10. Leno-Tunguska; 11. Okhotsk; 12. Penzhinsky

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Characterization of the metal content of oil shale is of particular interest to us, since they are the most often the main generators of hydrocarbons in the OGB. combustible Shales, like oils, contain more than 50 rare trace elements. A number of deposits oil shale is known for elevated concentrations of Mo, V, Ni, U, Cr, Cu, Re, Ge, Bi, Be and W. Some slates are industrial raw materials for metals such as Mo, V and Ni, for which technological schemes for their extraction have been developed.

Trace elements, incl. and PTE contain both mineral and organic components of shale. In the mineral parts are, as a rule, impurities of epigenetic origin in the form of exchange cations and isomorphic impurities in the composition of rock-forming minerals. In organic - they predominantly have a syngenetic origin and are in a sorbed state in the form of salts of organic acids or as part of complex and intracomplex elements organic compounds. Their concentration is especially high in asphalts - high-molecular compounds with high surface activity and present in combustible shales in large quantities. It was possible to trace the direct dependence of the values of the content vanadium, nickel and molybdenum from the heat of combustion of oil shale, i.e., in fact, from enrichment with organic matter. These metals are syngenetic to shale accumulation, their degree concentration is related to kerogen.

Leaks from nuclear waste tanks and releases from industrial storage facilities the Hanford plutonium production complex occur regularly, for example, in 2013, 2016, 2017. There are 177 steel underground tanks containing at least 212 thousand tons of radioactive components, consisting of more than 1800 chemical compounds to be accounted for. The total area of the accommodation zone is 26 hectares. The planned end of the decontamination and restoration work by the US government - 2052 year. That is, it is precisely until 2052 that the Columbia River and the adjacent section of the Pacific coasts pose a clear environmental and sanitary and epidemiological threat.

The Hanford plant and the results of its activities are a good illustration of the situation that even small concentrations of toxicants in the environment can be intensively accumulated living organisms permanently living in it. To a similar extent, this may apply to V, Co, Ni and other biophilic elements present in oil, as in products OV transformations. Moreover, the concentrators, as can be seen from the above, are all forms of living matter - plankton, unicellular algae, bacteria, fungi, herbs, higher plants, birds, i.e. all flora and fauna, although degrees of concentration vary.

The total one-time mass of living matter on Earth, according to various estimates, ranges from 2x1012 to 1013 tons. And, if we take the average content of only vanadium in the composition of living matter equal to 6x10-5%, then the one-time mass of this metal, attributed to the first - second hazard class, in living matter can be about 107-108 tons.

4. DISCUSSION AND CONCLUSION

As noted above, the prevalence of primary accumulation processes biophilic elements living biomass served as the basis for the formation of a whole directions of work in prospecting geology, especially on hidden mineralization, combined under a common name for lithobiogeochemical surveys. Among them are soil metallometry and vegetation, hydrogeochemistry, etc. In the course of various biogeochemical surveys, it has already accumulated large and usually high performance material.

Declarations

Source of Funding

This research did not receive any grant from funding agencies in the public, commercial, or not-for-profit sectors.

Competing Interests Statement

The authors declare no competing financial, professional, or personal interests.

Consent for publication

The authors declare that they consented to the publication of this research work.

Availability of data and material

The authors are willing to share the data and material according to relevant needs.

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Cite this article

Trinh, Q.V., DTN Huy & Sergey, Y. Reserves of Heavy Oil and Concentrations of Toxicants in the Environment and Environmental Impacts. Mediterranean Journal of Basic and Applied Sciences 6(4), 20–23 (2022).

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