

Change in the structural-group composition of bitumen asphaltenes upon thermal bitumen recovery

Yusupova T., Ganeeva Y., Romanov G., Barskaya E., Morozov V., Okhotnikova E., Vakhin A.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© 2017, Pleiades Publishing, Ltd. Comparative analysis of thermal analysis and EPR spectroscopy data on asphaltenes from Ashal'chinskoe and Mordovo-Karmal'skoe bitumens recovered by steam drive and in situ combustion has been performed. It has been found that the steam drive does not alter the structural-group composition of asphaltenes whereas the in situ combustion lead to conversion of asphaltenes into coke-like particles deposited onto the rock surface in the reservoir. It has been shown that the asphaltenes with a high proportion of condensed aromatic entities are carriers of genetic information on the petroleum system.

<http://dx.doi.org/10.1134/S0965544117020256>

Keywords

asphaltenes, natural bitumens, thermal recovery methods

References

- [1] R. Kh. Muslimov, G.V. Romanov, G.P. Kayukova, et al., Integrated Development of Permian Heavy Oils and Natural Bitumens of the Republic of Tatarstan (Fen, Kazan, 2012) [in Russian].
- [2] G. P. Kayukova, G. V. Romanov, R. Kh. Muslimov, et al., Chemistry and Geochemistry of Permian Bitumens of Tatarstan (Nauka, Moscow, 1999) [in Russian].
- [3] I. A. Posadov and Yu. V. Pokonova, Structure of Petroleum Asphaltenes (LTI imeni Lensovet, Leningrad, 1977) [in Russian].
- [4] G. N. Gordadze, Thermolysis of Organic Matter in Oil and Gas Exploration Geochemistry (IGIRGI, Moscow, 2002) [in Russian].
- [5] F. Trejo, G. Genteno, and J. Ancheyta, Fuel 83, 2169 (2004).
- [6] Yu. M. Ganeeva, T. N. Yusupova, V. I. Morozov, and G. V. Romanov, Pet. Chem. 53, 220 (2013).
- [7] Yu. M. Ganeeva, T. N. Yusupova, and G. V. Romanov, Usp. Khim. 80, 1034 (2011).
- [8] F. G. Unger, Fundamental Aspects of Petroleum Chemistry: Nature of Resins and Asphaltenes (Nauka, Novosibirsk, 1995) [in Russian].