

The influence of sand complexes of components of the bitumen deposit on the estimation of reserves of high viscosity oils

Grunis E., Khassanov D.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

In recent times there are an active investigations and exploration of natural bitumen and high-viscosity oils. Reservoirs of high-viscosity oil are characterized by high lithological and structural heterogeneity. According to knowledge of heterogeneity new tasks arise for lithological and petrophysical studies of such reservoirs: development of interpretation technique of geophysical well logging data which is suitable for investigating structures; analysis of the obtained information on the geological structure, petrophysical properties and estimation of the reserves of the investigated object based on the results of interpretation and laboratory studies of the core. The article describes the influence of sand complex types on estimation of reserves of high-viscosity oil by the example of two terrigenous uplifts of the Sheshhminskiy horizon of Ufimian stage on the south-east of the Republic of Tatarstan. The results of the research showed that the deposits of high-viscosity oil of Nizhniy-Karmal and Melnichniy uplifts have a block structure and are subdivided into three types of sand complexes, each type having different values wavelet-GK extremes. Complexes of the type 1 are the most promising in terms of reservoir development by the steam-thermal methods of extracting high-viscosity oil, since they contain a minimum amount of clay material filling the inter-grain space, which is largely filled with fluid. Complexes of the type 2 are promising in terms of development of a reservoir in the contact zone with complexes of the type 1. With the predominance of complexes of the type 3, the reservoir porosity and permeability decrease and as a result decrease reserves estimates.

<http://dx.doi.org/10.24887/0028-2448-2017-12-83-85>

Keywords

Bitumen, Heavy oil, Wavelet transform

References

- [1] Uspenskiy B.V., Geologiya mestorozhdeniy prirodnykh bitumov Respubliki Tatarstan (Geology of natural bitumen deposits of the Republic of Tatarstan), Kazan': Gart Publ., 2008, 348 p.
- [2] Grunis E.G., Primenenie novykh podkhodov k interpretatsii materialov GIS pri podschete zapasov sverkhvyyazkoy nefti i proektirovanii gorizonta'nykh skvazhin (The application of new approaches to the interpretation of well logging in the calculation of super-viscous oil reserves and the design of horizontal wells), Proceedings of International Scientific and Practical Conference "Gorizonta'nye skvazhiny i GRP v povyshenii effektivnosti razrabotki neftyan'nykh mestorozhdeniy" (Horizontal wells and fracturing in increasing the efficiency of development of oil fields), Kazan': Slovo Publ., 2017, 320 p.

- [3] Kosarev V.E., Correlation of well logs with use of wavelet-images of log curves (In Russ.), Karotazhnik, 2006, no. 1, pp. 37-48.
- [4] Grunin E.G., Khasanov D.I., Reserves calculation using the volume and probability methods with the aid of Petrel-2013 program package (In Russ.), Geologiya nefi i gaza = The journal Oil and Gas Geology, 2017, no. 5, pp. 129-134.