GRANULOMETRY AND FACTOR ANALYSIS IN STUDYING INHOMOGENEITY OF A TERRIGENOUS RESERVOIR

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The paper presents the results of a study of the granulometric composition of terrigenous reservoir of the Nizhne-Karmalskoye super-viscous oil deposit. The main interest is a sand pack composed of weakly cemented and loose fine and medium-grained sands and sandstones. Clastic grains are mainly bonded with high-viscosity oil. the thickness of the sand pack on the deposit varies widely. The grain size of reservoir rocks has a significant impact on the reservoir properties of rocks and reservoir productivity as a whole. To study the features of the granulometric composition of the reservoir, a statistical analysis such as principal component analysis (PCA) of laboratory data on 72 samples was performed. The use of PCA allowed to form a volumetric representation of the collector. Three main factors were identified that describe almost 79% of the total variance of the source data. The first factor (45.9 %) is characterized by significant positive loads on such parameters as the content of fine-grained fraction and the porosity coefficient. The second factor (18.3 %) is characterized by significant positive loads on the content of siltstone and fine-grained fraction, as well as significant negative loads on the parameter medium-grained fraction. The third factor (14.5 %) is characterized by significant positive loads on such parameters as the content of coarse-grained fraction and porosity. According to the results of the work, the most favorable areas were identified from the point of view of developing the deposit.

Keywords: petrophysics, grain size, terrigenous reservoir, factor analysis