

Investigation of rheological properties of additives with nanocomponent during the transportation of viscous oil

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Abstract

© SGEM2018. This work is investigation of the rheological properties of the developed additive based on polymer-sevylene with the addition of nanostructure alumina particles were studied. The regularities of the decrease in the dynamic viscosity at the temperature range from 20 to 10° In the course of the studies, a regularity was revealed, showing that for oil at a shear rate of 0.028 to 1.4 s⁻¹, a sharp decrease in viscosity from 1800 to 336 mPa•s is observed. For oil with an additive, the viscosity decreased from 1200 to 300 mPa•s. For oil with an additive containing a nanocomponent-from 600 to 312 mPa•s. C have been revealed. Viscosity decreasing is due to the change in the energy state of the surface layer, which is confirmed by the study of the surface properties that were carried out on the model liquid-diesel fuel in the temperature range from 25 to 5°C. The maximum efficiency in reducing surface tension from 23.8 to 22 mN/m is achieved at an additive concentration of 6 g/t. The assumption is made that in the additive with nanocomponent in the process of its presence in the carbon-hydrogen medium (diesel fraction) there is a partial adsorption of surfactant molecules on the surface of nanoparticles, which somewhat neutralizes the effect.

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Keywords

Additives, Oil, Surface tension, Viscosity

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