

عنوان مقاله:

An Experimental Study on Evaluation of Factors Influencing the Viscosity and Viscoelastic Properties of Waxy Crude Oil

محل انتشار:

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خلاصه مقاله:

The influences of several operating factors on the viscosity of the Isfahan refinery waxy crude oil sample are studied through conducting some rheological shear rotational tests. The Taguchi design method is adopted to determine the impact of factors such as shear rate, temperature, cooling rate, wax content, and asphaltene content on the viscosity of the waxy crude oil. The results show that temperature with a contribution of 53.61% is the most influential factor. The wax content, shear rate, and asphaltene content have a contribution of 20.86, 14.75, and 3.11% respectively. The cooling rate does not have a statistically significant effect on the viscosity. The results of the rheological oscillatory tests confirm that the temperature and wax content change the viscoelastic properties of the waxy crude oil completely. An increase in the wax content from 12 to 22 wt.% raises the wax appearance temperature (WAT) from 19.1 to 34.9 °C and improves the gel point from 13 to 34.1 °C. By decreasing the temperature or increasing wax content, the viscoelastic nature of the oil sample changes from a viscoelastic fluid to a viscoelastic solid.

کلمات کلیدی:

Rheological properties, Waxy Crude Oil, Wax Appearance Temperature, gel point, Design of experiment, Taguchi method

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