

عنوان مقاله:

Rheological Study of Heavy Crude Oils and Their Emulsions

محل انتشار:

کنفرانس بین المللی فرآورش پلیمرها (سال: 1390)

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نویسندگان:

Mohammad Bagher Sadeghi - *Department of Chemical and Petroleum Engineering, Sharif University of Technology, Tehran, Iran*

Ahmad Ramazani Saadat Abadi - *Department of Chemical and Petroleum Engineering, Sharif University of Technology, Tehran*

,Vahid Taghikhani - *Department of Chemical and Petroleum Engineering, Sharif University of Technology, Tehran*

,Cyrus Ghotbi - *Department of Chemical and Petroleum Engineering, Sharif University of Technology, Tehran*

خلاصه مقاله:

The increasing oil demand is leading to usage of the very large world resources of heavy crude oils that are of the same order of magnitude than conventional oils. However, the major difficulty for producing and transporting these crude oils comes from their very high viscosities. Emulsions either water-in-oil or oil-in-water emulsions can be important in almost all stages of upstream activities in petroleum industry such as transportation, production, completion, drilling, and separation of emulsified crude oils. Therefore, an understanding of the rheological behavior of these types of crude oils and their emulsions is important to choose the right approach in designing the required facilities. In this study, the emulsion rheological behavior was investigated as a function of shear rate, temperature, surfactant concentration, and dispersed phase concentration. A rheometer (PAAR Physica MCR 301) was used to measure the rheological behavior of the crude oil and its emulsions. Emulsion characterization was determined by measuring the droplet size distribution of the dispersed phase using optical microscopy. Rheological modeling of emulsion as a function of temperature, dispersed phase concentration, and shear rate, was also another aim of this work. Experimental data suggest that the rheological behavior of emulsions can be best approximated by a power-law relation. The results show that at low dispersed phase concentration, the emulsions behave as Newtonian fluids, however, at high dispersed phase concentration they behave as non-Newtonian fluids. It was also observed that the viscosity decreases with temperature, and the highest viscosity was observed at the point close to phase inversion

کلمات کلیدی:

Rheological Behavior, Heavy Crude Oil, Emulsion

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