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SYNTHESIS AND APPLICATION OF AN EFFICIENT DEGREASING AGENT FOR OILY DRILLING CUTTINGS

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Abstract

Oil-based drilling fluids are widely used in oil and gas exploration and development. Large amounts of oily drilling cuttings are produced in the drilling process, and improper treatment can cause serious secondary pollution. Chemical cleaning is commonly used to treat oily drilling cuttings. However, most degreasing agents are not environmentally friendly and can cause secondary pollution. Thus, the processing requirements of oily cuttings are difficult to meet. In this study, an environmentally friendly degreasing agent CYJ-1 that is biodegradable and can efficiently treat oily drilling cuttings was designed and prepared using optimized treatment agents and conditions, achieving an oil removal rate of 93.02%. In addition, a harmless degreasing formula utilizing this environmentally friendly degreasing agent was developed and had a remarkable oil removal effect on oily drilling cuttings. Transition state theory was applied to explain the degreasing effect of oily drilling cuttings for the first time, and the mechanism of action of the degreasing agent was analyzed in conjunction with the interfacial tension and potential energy. The formula was applied at two wells in the Xinjiang oilfield in China. It could achieve a high oil removal rate, which efficiently solved the pollution and resource recovery problems associated with oily drilling cuttings.

Key words: degreasing agent, efficient, degreasing mechanism, field application, oily drilling cuttings

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