عنوان مقاله:

Investigating the Effect of Polythin and Polydrill on the Properties of Drilling Fluids

محل انتشار:

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خلاصه مقاله:

In this study, synthetic sulfonated polymers were used in order to enhance the rheological properties of drilling fluids. The capability of these polymers in reducing the effects of environmentally friendly, but harmful, pollutants such as cement, calcium chloride, gypsum as well as pH changes were investigated. In the present work, two sulfonated synthetic polymers, namely Polythin and Polydrill, which are considered to be environmentally friendly polymers, were used. Polydrill controls the fluid loss and is resistant to high temperatures and also pollutants. The injection of this polymer into drilling fluid slightly increases the viscosity levels. Polythin prevents the precipitation of bentonite at high temperatures and facilitates fluid pumping by reducing its rheological and static shear strength. Polythin polymer also prevents the formation of bentonite gelation (precipitation of bentonite) at higher temperatures and is stable up to ۲۶۰ °C. This polymer is also capable of completing the effects of fluid loss additives and reduction of filtration in HTHP drilling fluids. Furthermore, this polymer reduces rheology, strength, and static shearing values and facilitates pumping of the drilling fluid. The combination of aforementioned polymers improves the thermal resistance of drilling muds while maintaining the rheology and reducing the amount of filtrate for HTHP drilling fluids. In these experiments, the rheological properties of the fluid including apparent viscosity (AV), plastic viscosity (PV), yielding point (YP), gelation resistance or gel strength (GEL), fluid loss (FL), and the pH of the fluid were studied before and after the addition of the pollutants. The results indicate that certain proportions of these two polymers increase the rheological properties of drilling fluids and can significantly change the weight percentages of pollutants. It is also notable that the rheological properties were normally constant. However, in some cases, smaller values of rheological parameters enhanced the efficiency in the presence of pollutants. In the case of calcium chloride, rheological parameters (AV, PV, YP, and gel strength) are almost constant, while fluid loss greatly increases.

کلمات کلیدی:

Drilling Fluid, Rheology, Filter Loss, Sulfonated Polymer, Contamination Tolerant Additives, Environmentally Friendly

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