

Abstract

Drilling in HT/HP wells has adverse effects on drilling fluids. At high temperatures and pressures, the chemical additives used in drilling fluid formulations experience thermal degradation above 107°C (225°F) leading to strong variations (reduction) in rheological and filtration characteristics. Locally derived Rice-Husk and grounded Plantain peels were used to improve the rheology and filtration properties of back-loaded oil based mud at HT/HP behavior, and the results were compared to industrial additives like Sodium Carboxymethylcellulosics (CMC), Polyanionic Cellulosics (PAC), and Sodium Polyacrylates (SPA). This research was centered on the use of three oil-based mud samples from a particular field in the Niger Delta basin. The samples included; a reconditioned mud, a freshly prepared mud (both with standard industry additives), and a back-loaded mud respectively. Seven [7] different mud property tests were carried out on the samples to determine their current state. After that, the back-loaded mud was upgraded with the locally derived additives and its rheological and filtration properties were observed and compared to the results of the first two samples. The effects of high temperature and high pressure on the stability of the locally-derived additives were also observed. This was paramount because the chemical additives underwent thermal degradation at these conditions. The most significant finding is that the locally derived additives worked at the same level or probably better than the industrial additives.

The novelty of this research was to evaluate the potential of locally derived additives for improvement of mud rheology and filtration in comparison with industrial additives. Also, a reduction in the cost of purchasing foreign viscosifiers and filtration control additives by patronizing locally derived additives hence reducing the overall cost of a mud program. Lastly to make sure that wastes like rice husks and plantain peelings are recycled by usage in drilling mud formulations so as to prevent environmental problems such as heaping of refuse on the streets.