Heat moisture modified rice flours as additive in drilling fluids

ABSTRACT

Drilling mud is a dense, viscous fluid mixture used in oil and gas drilling operations to bring rock cuttings to the earth's surface from the boreholes as well as to lubricate and cool the drill bit. Water-based mud is commonly used due to its relatively inexpensive and easy to dispose of. However, several components and additives in the muds become increasingly cautious and restricted. Starch was introduced as a safe and biodegradable additive into the water-based drilling fluid, in line with an environmental health concern. In this study, the suitability of four local rice flours and their heat moistures derivatives to be incorporated in the formulation of water-based drilling fluid was investigated. They were selected due to their natural amylose contents (waxy, low, intermediate, and high). They were also heat moisture treated to increase their amylose contents. Results showed that the addition of the rice flours into water-based mud significantly reduced the density, viscosity, and filtrate volume. However, the gel strength of the mud was increased. The rice flours, either native or heat moisture treated, could serve as additives to provide a variety of low cost and environmentally friendly drilling fluids to be incorporated and fitted into different drilling activity.

Keyword: Heat moistures treatment; Amylose content; Rice; Drilling mud