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**Study of the factors affecting the rheological behaviour of the adjusting polymer “xanthan” in drilling muds**

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**A B S T R A C T**

The study carried out as part of this work has two main objectives: first, to analyse the impact of parameters influencing the rheological behaviour of an adjusting polymer used in drilling muds, namely xanthan gum. This extracellular polysaccharide is produced by *Xanthomonas campestris* and is characterised by its good resistance to high temperatures and salinity. The parameters examined include polymer concentration, temperature, and salinity. Second, the study aims to physically and chemically characterize the drilling mud containing the formulated adjusting polymer at the EIRA laboratory. The experimentation was carried out using an MCR 302e Anton Paar rheometer equipped with a coaxial cylinder geometry of the Couette type. The selected shear rate range extends from 0.1 to 1000 s<sup>-1</sup>. Rheological tests were performed at ambient temperature, except for those examining the effect of temperature, which varied up to 80°C. The results show that the effect of xanthan gum concentration on the apparent viscosity of solutions depends on the applied shear rate. The shear-thinning behaviour of xanthan solutions remains constant with increasing temperature. Furthermore, the presence of salts increases xanthan viscosity due to the branched chains it contains. The incorporation of xanthan solutions containing salt into a drilling mud formulation alters its physicochemical characteristics, leading to an increase in both apparent and critical viscosities.

**Keywords:** Oil drilling; Drilling mud; Adjustment polymer; Xanthan gum; Rheological behaviour; Temperature; Salinity

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