

EFFECT OF POLYMERS AND SALT ON THE RHEOLOGICAL PROPERTIES OF WATER- BASED DRILLING FLUIDS

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Water-based drilling fluids are used at different steps of well construction, i.e.drilling, completion. Their functions are various: to carry the rock cutting to the surface, to maintain a sufficient pressure against the rock formation, to lubricate and cool the bit. Water –based drilling fluids formulations have evolved to very complex compositions of aqueous solutions of clays and polymers.

Organic polymers (PAC, xanthan and PHPA) which constitute mainly components of well drilling fluids are commonly used to control the rheological properties and filtrate loss required for water –based drilling fluids. To that effect an ecologically –friendly water- based drilling fluid was developed by studying the rheological behaviour and electrokinetic properties of xanthan gum, polyanionic cellulose (PAC) and partially hydrolysed polyacrylic (PHPA) on bentonitic water suspensions. The influence of these polymers and salt on the rheological properties of water–based drilling fluids was determined using various characterization methods like rheological and electokinetic measurements.

The drilling fluid that was developed has better rheological properties and fluid loss control which are required for optimum performance of oil well drilling, and the rheological data represented very well by the Hershell-Bulkley and Cross models for all experimental conditions.