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**Impact of Nano-Particles on the Rheological Properties of Drilling Fluids**

Aman Mehdi Tahqiq Husaina, Matheen Pasha Zb, Mohammed Touheed V Ic, **Bhairab Jyoti Gogo**id

a,b,c.4th year student of B.Tech Petroleum Engineering, Presidency University Bengaluru.

d.Assistant Professor, Department of Petroleum Engineering, Presidency University, Bengaluru.

**Abstract**

In geotechnical engineering, drilling fluid is used to aid of borehole into earth. Liquid drilling fluid is often called drilling mud. The main functions of drilling fluid is providing hydrostatic pressure to prevent formation fluids entering into the well bore, keeping the drill bit cool and clean during drilling, etc. These days bentonite a natural occurring material is used in drilling fluid. In this work we have synthesis three samples of bentonite with varying sizes, ranging from micro to Nano sizes by grinding them with Planetary Ball Mill. With the help of FTRI and XRD the functional group and the nature of particles have been determined. Here our work mainly focuses on the reactivity between the particle and the fluid, as due to Nano size the surface contact area increases. Here we have prepared a water based mud (WBM) and other polymers have also been used during the process. Here we have reduced bentonite to Nano size and then examined it while using it in the water based drilling mud. Therefore we will develop a mud made up of Bentonite Nano particles that should be mechanically strong, physically small and thermally stable in comparison to the micro sizes. After all we’ll be concluding that as the surface contact area increases the reactivity also increases and hence there is a significant change in the physical properties of drilling fluid.

**Keywords:**

Drilling fluid, Bentonite, Nano particle, XRD, FTRI, Planetary Ball mill

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