Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

High-pressure high-temperature rheological studies of colloidal suspensions with carbon nanotube ANOOP BABY, Texas AM University at Qatar, REZA SADR, Texas AM University, ROMMEL YARC, MAHMOOD AMANI, Texas AM University at Qatar — Selection of the drilling fluid, drilling mud, is vital in minimizing the cost and time required for the drilling in oil fields. Drilling mud aids in cooling, lubricating drilling bit, removing the debries from the drill bore and maintaining the wellbore stability. Owing to the enhanced thermophysical properties and stable nature, suspensions of nanoparticles have been suggested for drilling fluids. High-pressure and high-temperature rheology of a nanomud suspension (nano particles suspended in a mud solution) is studied here. The nanomud is prepared by dispersing a water-based drilling mud suspension (water with 1% Bentonite and 7%Barite particles) with multi-walled carbon nanotubes, MWCNT. The effect of pressure, temperature, and shear rate are independently studied for the various particle loading of the nanoparticles. Viscosity values are measured at a maximum pressure of 170MPa with temperatures ranging from ambient to 180oC. The effect of MWCNT concentration and variation in shear rate are also investigated A shear thinning non-Newtonian behavior is observed for the basemud and the nanomud samples for all cases. The basemud showed an increase in viscosity with an increase in pressure. However, with MWCNT particle addition, this trend is observed to have reversed.

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Date submitted: 01 Aug 2017 Electronic form version 1.4