

Abstract Submitted
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Rheological assessment of nanofluids at high pressure high temperature¹ ANOOP KANJIRAKAT, REZA SADR, Texas A&M University at Qatar — High pressure high temperature (HPHT) fluids are commonly encountered in industry, for example in cooling and/or lubrications applications. Nanofluids, engineered suspensions of nano-sized particles dispersed in a base fluid, have shown prospective as industrial cooling fluids due to their enhanced rheological and heat transfer properties. Nanofluids can be potentially utilized in oil industry for drilling fluids and for high pressure water jet cooling/lubrication in machining. In present work rheological characteristics of oil based nanofluids are investigated at HPHT condition. Nanofluids used in this study are prepared by dispersing commercially available SiO₂ nanoparticles (~20nm) in a mineral oil. The basefluid and nanofluids with two concentrations, namely 1%, and 2%, by volume, are considered in this investigation. The rheological characteristics of base fluid and the nanofluids are measured using an industrial HPHT viscometer. Viscosity values of the nanofluids are measured at pressures of 100kPa to 42MPa and temperatures ranging from 25°C to 140°C. The viscosity values of both nanofluids as well as basefluid are observed to have increased with the increase in pressure.

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