

Squalane – a HTHP Viscosity Standard Re-examined

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Fluid properties directly impact decisions at all stages of the reservoir life cycle from planning the first drilling program through final abandonment of the field. Thus, the quality of fluid property measurements is critically important for field success. Viscosity is one of the most important fluid properties on which oil field decisions are based. Unfortunately, current viscosity standards for viscometer calibrations are inadequate to support improved accuracy in high pressure, high temperature conditions in the new deepwater and other development environments.

The viscosity of reservoir fluids is routinely measured in commercial laboratories with capillary and falling body viscometers. To lower the uncertainty of routine viscosity measurements, viscometers require accurate calibrations with reference fluids at the relevant conditions. Consequently, expansion of viscosity standards to elevated conditions is a critical need in the industry and a collaborative project to define and develop appropriate viscosity standards for these new conditions was undertaken. Squalane (C₃₀H₆₂; 2,6,10,15,19,23-hexamethyltetracosane) was identified by the group as a fluid suitable for the calibration of laboratory viscometers and as a viscosity reference fluid.

As part of this effort, a new Squalane viscosity correlation was developed based on a critical literature review, a novel approach for robust regression and an analysis of the Stickel functions. In this presentation, the new correlation will be compared with previous models, and it will be discussed in context of the historical effort to create viscosity standards to support reduced uncertainties in high pressure, high temperature conditions.