

Updated Friction Theory Viscosity Model applicable to the Full Range of Reservoir Fluids and Blends

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Viscosity and density are thermophysical properties required in many applications within the petroleum industry. In the past, the friction theory (FT) approach has proven to accurately model the viscosity and density of a wide variety of reservoir fluids ranging from natural gas to heavy oil. The FT approach consists of a compositional characterization method, an applicable Equation of State (EoS) (such as a cubic EoS) and an EoS based FT viscosity model. This combination of these three methods is capable of delivering an integrated approach for the accurate description of the phase, PvT and viscosity behaviour of reservoir fluids. The updated model presented in this work extends the FT approach to larger compositional, temperature and pressure ranges compared to previous work. Combined with continuous thermodynamic principles, the new FT modelling approach can be easily applied to areas that require computational efficiency, as in the case of flow simulations, or which require high compositional accuracy, such as distillation. The applicability of the FT models has also been extended to ranges of viscosity which vary from single digit mPa's up to hundreds of thousands. The new approach has also been improved to deliver accurate predictions of blend properties. In this presentation, results from the FT modelling approach will be summarized and discussed for a variety of reservoir fluids.