

EFFECT OF ASPHALTENE ON THE RHEOLOGICAL PROPERTIES OF BITUMEN

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ABSTRACT

The rheological behaviour of bitumen as a function of asphaltene concentration has been studied. Several bitumen samples having distinctly different amounts of asphaltene were prepared and characterized using differential scanning calorimetry and rheological measurements. The glass transition temperature of bitumen increases with an increase of the asphaltene concentration. This correlation can be used to estimate the asphaltene concentration of bitumen samples using DSC measurements. Small-amplitude oscillatory shear data for the bitumen-derived samples were fit by the generalized Maxwell model with good agreement. A constitutive model is proposed, where the zero-shear complex viscosity of the bitumen sample is a strong function of the asphaltene concentration, and it can be used to predict the asphaltene concentration.