

Correlations of Dynamics Viscosity and Kinematic Viscosity of Fatty Acid from Gibbs Energy Additivity Approaches

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Abstract.

Dynamic viscosity and kinematic viscosity are important physical properties of a liquid. In this work, correlation of dynamic viscosity and kinematic viscosity of fatty acids (FA) are correlated to the Martin's rule of free energy additivity for estimated kinematic viscosity and dynamic viscosity from their own equations. The proposed equations for estimating viscosity and density of FA are correlated to number of carbon atoms, number of double bond(s) and temperature. Data collected from literatures were used to validate, and support the proposed models. The proposed equations are easy to use and the estimated dynamic viscosity and kinematic viscosity values of FA at different temperatures agree well with the literature values. The average absolute deviation of dynamic viscosity and kinematic viscosity of FA at 297.05-394.25 K are 4.14 and 4.37, respectively. The estimated outside temperature between 288.15 and 363.15 K may be possibly estimated by this model but accuracy may be lower

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