138f Generalized Svrc-Qspr Predictions of Saturated Liquid and Vapor Viscosities

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Reliable predictions of vapor and liquid viscosities are important in many industrial applications. Current models for predicting the fluid viscosities have a limited range of applicability and poor suitability for generalization.

In this work, we develop non-linear Quantitative-Structure-Property Relationships (QSPR) for predicting input parameters for the Scaled-Variable-Reduced-Coordinate (SVRC) framework, which provides reliable predictions for pure-fluid liquid and vapor viscosities over the entire saturation range (triple to critical point). Specifically, we (a) demonstrate the efficacy of the SVRC in providing accurate liquid and vapor viscosities of diverse molecular species using QSPR parameter generalizations, and (b) explore significant molecular descriptors which are pertinent in modeling liquid and vapor viscosities.

In general, the SVRC-QSPR model is capable of predicting saturation properties of pure fluids with average errors of less than 1%.