

## Evaluation of New Experimental Data as Part of the NIST-Journal Cooperation: Modeling Applications

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TRC/NIST has an established cooperation with five major journals in the field of thermodynamics, thermophysics, and thermochemistry: the Journal of Chemical and Engineering Data, Fluid Phase Equilibria, The Journal of Chemical Thermodynamics, International Journal of Thermophysics, and Thermochimica Acta. Prior to publication, newly measured experimental data are evaluated by data experts using ThermoData Engine for completeness of description, physical consistency, and consistency with the existing literature. Experience in dynamic data evaluation at TRC/NIST has shown that interpretation of a data set through the lens of physical models is necessary for proper assessment of experimental data. There are different aspects of data quality assessment facilitated by modeling: mutual consistency within the same data set, consistency with available literature data, physical validity of model parameters, consistency of different properties interrelated by thermodynamic relations, and reasonable variation in a series of similar substances. A wide range of conclusions can be drawn on the basis of modeling, from invalidation of erroneous results to determination of data reliability, from revealing anomalies to supporting unexpected results. Several examples will be shown to illustrate application of property data modeling. With the current level of development in this field, it seems crucial that modeling should supplement any experimental research to support measured data.