

Propagation of Uncertainty in Correlated and Independent Input Quantities According to the Guide to the Expression of Uncertainty in Measurement

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In this work we present the calculations to obtain the triple, normal and critical pressures of several pure substances by use of the Wagner equation in its different forms and compare the results with the literature. The parameters of this equation are highly correlated and it is necessary to include the cross terms of the variance-covariance matrix in order to reduce the uncertainty to a level which is in accordance with the experimental one. In other words, if we take the parameters of the equation as independent, the uncertainty of the calculated pressures is too high. We do the comparison in both cases and stress the central role that the variance-covariance matrix plays in the propagation of uncertainty [1].

[1] *Guide to the Expression of Uncertainty in Measurement*. **1995**, Geneva:ISO.