

Trial to Estimate Uncertainties of Helmholtz Equation of State for Refrigerants

Yohei Kayukawa^{C, S}

National Metrology Institute of Japan, National Institute of Advanced Industrial Science and Technology,

Tsukuba, Japan

kayukawa-y@aist.go.jp

In the fluid property calculation software, REFPROP, several Helmholtz energy equations of state (EOS) for refrigerants are compiled. They are used as a standard reference value of thermodynamic properties for these refrigerants. Since uncertainties of the prediction by such EoS are not clearly claimed except a few information, most of users do not care how it is accurate. Although statistical fitting procedure are used in developments of EoS, experimental uncertainties of the input data are not fully reflected in the EoS. In the present study, statistical approach based on covariance of the input data were employed in order to evaluate the EoS for R1234yf. Results for evaluated uncertainties for prediction by the EoS is presented including derived properties such as heat capacities and enthalpies.