

## **Solubility of 2,3,3,3-Tetrafluoroprop-1-ene (R1234yf) in Pentaerythritol Tetrapentanoate (PEC5) in the Temperature Range from 283.15 to 353.15 K**

Na Gong, Yanjun Sun and Xiaopo Wang<sup>C, S</sup>

*Key Laboratory of Thermo-Fluid Science and Engineering, Ministry of Education, Xi'an Jiaotong University,  
Xi'an, Shaanxi Province, China  
wangxp@mail.xjtu.edu.cn*

Chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) are being phased out according to the Montreal Protocol. Recently, unsaturated fluorinated compounds known as hydrofluoro-olefins (HFOs) have been proposed as promising refrigerants due to their lower GWPs and short atmospheric lifetime. 2,3,3,3-Tetrafluoroprop-1-ene (HFO1234yf), joint developed by Honeywell and Dupont, has a very low GWP of about 4 and a very short atmospheric lifetime of 0.03 years. It offers similar thermophysical properties to HFC134a, and has been accepted as an alternative refrigerant. In this work, the solubilities of 2,3,3,3-Tetrafluoroprop-1-ene (HFO1234yf) in pentaerythritol tetrapentanoate (PEC5) have been measured from 283.15 to 353.15 K based on the isochoric method. The experimental solubility data were correlated using the Peng–Robinson equation of state with Huron–Vidal mixing rules and the NRTL equation for the excess Gibbs energy at infinite pressure. The absolute average deviation between experimental data and calculated values was 0.86 %, and the maximum relative deviation was 3.23 %.