

High-Pressures VLE Measurement of CO₂ + 1,1,1,2-Tetrafluoroethane (HFC-134a) Binary Systems

임준혁, 진정민, 유기풍, 임종성*
서강대학교
(limjs@sogang.ac.kr*)

Generally, vapor liquid equilibrium (VLE) data required as one of the most important types of information in evaluating the performance of refrigeration cycles and determining their optimal compositions. A blend of carbon dioxide and HFC refrigerants may have good potentials for alternative CFC refrigerants. In this work, the VLE data of binary mixture containing 1,1,1,2-tetrafluoroethane (R-134a) and carbon dioxide were measured at various isothermals (323.15 ~ 343.15 K). To facilitate easy equilibration, both the vapor and liquid phases were circulated separately in the experimental apparatus. The equilibrium composition for both vapor and liquid phase were analyzed by a gas chromatograph. The measured data were correlated with the Peng-Robinson equation of state [PR-EOS] combined with the Wong-Sandler mixing rules. We compared the calculated data by using the PR-EOS with experimental data and reached satisfactory consistency.