Vapor-Liquid Equilibrium Data Concerning Refrigerant Systems: Equipment, Data and Modelling

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The development of modern refrigeration systems is critical for the success of new global environmental protection efforts; accurate thermo-physical data are of utmost interest for the development of new efficient refrigeration systems. For measurement purposes, a reliable "static-analytic" method taking advantage of two online micro capillary ROLSI™ samplers was used for all PTxy measurements presented herein. The binary systems of refrigerants that have been studied as an application of the experimental techniques are:

- Hexafluoroethane (R116) + 1,1,1- trifluoroethane (R143a), from 258 to 328 K at pressures from 0.39 to 3.89 MPa.
- Hexafluoroethane (R116) + 1,1,1,2-tetrafluoroethane (R134a), from 263 to 353 K at pressures from 0.2 to 4.2 MPa
- Carbon dioxide (R744) + 1, 1-difluoroethane (R152a) from 258 to 343 K at pressures from 0.14 to 7.65 MPa.

The model composed of the Peng-Robinson equation of state, the Mathias-Copeman alpha function, the Wong-Sandler mixing rules and the NRTL cell theory is applied to correlate the data and calculate critical lines.