

Isothermal Vapor-Liquid Equilibrium for Methane + Mesitylene and Ethane + Mesitylene Binary Systems

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In the refining process, cracking gas is produced as a kind of by-product which contains hydrogen, methane, ethylene, propylene and so on. Methane, ethylene, and propylene constitute a large fraction in the cracking gas (about 50-60% in volume). Absorption for separating ethylene from cracking gas was recognized to be a good approach. Generally, the measurement of phase equilibrium data is essential for ethylene separating in absorption-desorption process. The aim of this work is to study the behavior of vapor-liquid equilibrium of methane + mesitylene and ethane + mesitylene system by use of a set of vapor-liquid equilibrium apparatus with the static equilibrium method, which mainly consists of a vapor-liquid equilibrium cell with 160 ml in volume and a maximum operation pressure range around 6 MPa, and a gas chromatograph for on-line analyzing the vapor and liquid compositions. The vapor-liquid equilibrium data of the methane + mesitylene and ethane + mesitylene systems at four temperatures 233.15 K, 253.15 K, 273.15 K and 293.15 K, and pressure from 0 to 3 MPa were measured and correlated with the Peng-Robinson equation of state. As a result, the interaction parameters were regressed.