

Vapor-liquid equilibria for the binary system of Acetonitrile + 1-butyl-3-methylimidazoliumiodide at various temperatures from 283.15K to 343.15K

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Ionic liquids have gained much attention due to its unique chemical and physical properties, such as a high polarity, low melting pressure, non-volatility, and high thermal stability. These characteristics of ionic liquids give itself chance to be utilized in many applications, for example, dye sensitized solar cells(DSSCs) and supercapacitors. In case of DSSCs, acetonitrile-electrolyte is the most commonly used, but it has a problem of unstability of acetonitrile-electrolyte. In this study, vapor-liquid equilibria (VLE) for the acetonitrile + 1-butyl-3-methylimidazoliumiodide (BMImI) system were measured for seven isotherms ranging from 283.15K to 343.15K at 10K intervals. The VLE data of the binary mixture was obtained using static apparatus at various compositions. The experimental data have been correlated with Peng-Robinson (PR) equation of state using one-fluid mixing rule. The correlation results by Peng-Robinson equation of state with one-fluid mixing rule are in reasonable agreement with the experimental data.