

High-Pressure phase Behavior of CO₂ in the Ionic Liquids

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Volatile Organic Compounds (VOCs) are commonly used in various industries, but most of VOCs are toxic. VOCs are sometimes accidentally released into the environment, where they can damage soil and ground water. But the non-volatility of ionic liquid would not cause environmental pollution. In this reason, the ionic liquids receive attention recently as a green solvent. The solubility of CO₂ in ionic liquids, 1-butyl-1-methylpyrrolidinium trifluoromethanesulfonate ([BMP][TfO]), 1-butyl-1-methylpyrrolidinium bis(trifluoromethylsulfonyl)imide ([BMP][Tf₂N]) and trihexyltetradecylphosphonium bis(trifluoromethylsulfonyl)imide ([P14,6,6,6][Tf₂N]) have been experimentally studied for development of a separation process of mixed gas containing CO₂. The solubility of CO₂ in ionic liquids was measured by using high pressure variable volume view cell. The solubility of CO₂ is determined by measured the bubble point pressure at fixed temperature. The range of temperature for the experimental measurements is from 30°C to 100°C in 10°C intervals. PR-EoS and mixing rules were used for calculate the equilibrium pressure.