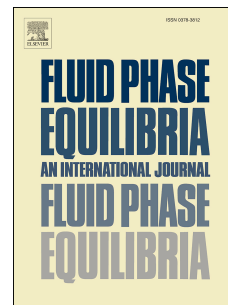


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Carbon Dioxide Solubilities in Tricyanomethanide-Based Ionic Liquids: Measurements and PC-SAFT Modeling

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ABSTRACT

This work reports the measurements of the solubility of carbon dioxide (CO₂) in three tricyanomethanide based ionic liquids (ILs) constituted by different cations: 1-butyl-3-methylimidazolium, 1-butyl-4-methylpyridinium, 1-butyl-1-methylpyrrolidinium in order to investigate the effect of the cation on the solubility. The solubility of CO₂ have been determined using high-pressure variable volume cell in a range of temperature from T = (292.13 to 367.85) K and pressure up to 121.6 bars. A high solubility of CO₂ in the 1-butyl-4-methylpyridinium tricyanomethanide was observed in comparison with the other cation. It was found that the Perturbed-Chain Statistical Associating Fluid Theory (PC-SAFT) may be used to represent with good accuracy the experimental data of CO₂ solubility in tricyanomethanide based ionic liquid.

Keywords: ionic liquids, solubility, carbon dioxide, equation of state, PC-SAFT

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