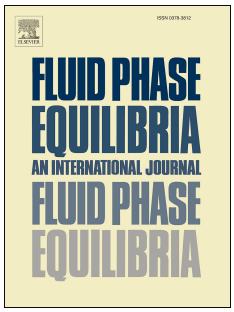
# Accepted Manuscript




Carbon dioxide solubilities in tricyanomethanide-based ionic liquids: Measurements and PC-SAFT modeling

Amel Ayad, Amina Negadi, Fabrice Mutelet

PII: S0378-3812(18)30167-5

DOI: 10.1016/j.fluid.2018.04.020

Reference: FLUID 11815

To appear in: *Fluid Phase Equilibria*

Received Date: 19 February 2018

Revised Date: 17 April 2018

Accepted Date: 17 April 2018

Please cite this article as: A. Ayad, A. Negadi, F. Mutelet, Carbon dioxide solubilities in tricyanomethanide-based ionic liquids: Measurements and PC-SAFT modeling, *Fluid Phase Equilibria* (2018), doi: 10.1016/j.fluid.2018.04.020.

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

Amel AYAD[1], Amina NEGADI[1], Fabrice MUTELET[2*]

1-LATA2M, Laboratoire de Thermodynamique Appliquée et Modélisation Moléculaire, Université de Tlemcen, BP. 119, Tlemcen 13000, Algérie.

2-Universite de Lorraine, Ecole Nationale Superieure des Industries Chimiques, Laboratoire Reactions et Genie des Procedes (UMR CNRS 7274), 1 rue Grandville, 54000 NANCY, France.

ABSTRACT

This work reports the measurements of the solubility of carbon dioxide ($CO_2$) 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 $CO_2$ 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 $CO_2$ 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 $CO_2$ solubility in tricyanomethanide based ionic liquid.

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