

Measurement of solubility of carbon dioxide in ionic liquid: 1-Ethyl-3-methylimidazolium methyl sulfonate and 1-Ethyl-3-methylimidazolium methane sulfate

하승재, 임종성[†]

서강대학교

(limjs@sogang.ac.kr[†])

The solubility of CO₂ in ionic liquids to compare the different of having oxygen anion, 1-Ethyl-3-methylimidazolium methane sulfate ([c2mim][SO₃CH₃]), 1-Ethyl-3-methylimidazolium methyl sulfonate ([c2mim][SO₄CH₃]) was measured. The solubility of CO₂ was determined by measuring the bubble point pressure or cloud point pressure at the temperature ranges from 303.15 to 373.15 K in 10 K intervals. Also, the measured data were correlated with the PR-EoS incorporated with the conventional van der Waals one fluid mixing rule. The critical properties of ionic liquids were estimated using the modified Lydersen-Joback-Reid method. As a result, ([c2mim][SO₄CH₃]) has higher CO₂ solubility than ([c2mim][SO₃CH₃]). It implies that the CO₂ solubility is affected by different of existence and nonexistence of oxygen in ionic liquid. From this result, it is concluded that the oxygen anion enhances the CO₂ solubility in ionic liquid.