The Solubility of CO_2 in Ionic Liquids including Pyrrolidinium Derivatives

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Ionic liquids (ILs) is considered to have a large variety of applications in chemical industry area because of their common characteristics, non-volatility and non-flammability. And ILs keep liquid state at room temperature or below. The chemical and physical properties of ILs are multipurpose by changing cation-anion combination. The basic application of ILs is the use as a solvent to purify gases. This study focuses on the interaction of ILs-CO_2 to separate ILs from organic solvents by CO_2 and to recover solutes from ILs with CO_2.

The solubility of CO_2 in ILs, N-propyl-N-methylpyrrolidinium bis(trifluoromethylsulfonyl) imide, N-pentyl-N-methylpyrrolidinium bis(trifluoromethylsulfonyl)imide, N-heptyl-N-methylpyrrolidinium bis(trifluoromethylsulfonyl)imide has been experimentally measured with range of temperature from 303.15 K to 373.15 K. The anion bis(trifluoromethylsulfonyl)imide [Tf_2N] is fixed so as to clarify the effect of cation alkyl chain in separation process of mixed gas containing CO_2.