Solubilities of Gases in the Room Temperature Ionic Liquid 1-n-Butyl-3-methylimidazolium bis (Trifluoromethylsulfonyl)imide

이병철*, Stephanie L. Outcalt[1], Joseph W. Magee[1]
한남대학교 나노생명화학공학과;
[1]Physical and Chemical Properties Division,
National Institute of Standards and Technology, USA
(bclee@mail.hannam.ac.kr*)

Solubility data of carbon dioxide, propane, propylene, n-butane, and 1-butene in the ionic liquid 1-n-butyl-3-methylimidazolium bis(trifluoromethylsulfonyl)imide ([bmim][Tf2N]) are presented at temperatures between 280 K to 340 K and at pressures up to 4.8 MPa. The equilibrium pressure at a given temperature and the amount of the gas dissolved into the ionic liquid were measured using a high-pressure apparatus equipped with a cylindrical equilibrium view cell, based on a saturation method. It was observed that all gases studied in this work had a considerable solubility in the [bmim][Tf2N] and alkene gases were more soluble than alkane gases. The Henry's law constants of each gas in the ionic liquid were estimated as a function of temperature from the experimental solubility data, and were compared to those predicted from the COSMOtherm model.