

## Study of CO<sub>2</sub> absorption in polymeric membrane with high pressure gravimetric analyzer

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In this work, we present new solubility results for carbon dioxide in the ionic liquid 1-ethyl-3-methylimidazolium tetrafluoroborate (emim[BF<sub>4</sub>])/Polymer membrane for temperatures ranging from (298.2 to 318.2) K and pressures up to 10.0 MPa using a thermogravimetric microbalance. Carbon dioxide solubilities were determined from absorption saturation (equilibrium) results at each fixed temperature and pressure. For highly accurate weight measurements all potential disturbances caused by the environmental of the samples to be weighed have to correct the buoyancy effect. The buoyancy effect was accounted for in the evaluation of the carbon dioxide solubility. A highly accurate equation of state and a group contribution predictive method for carbon dioxide and for ionic liquids, respectively, were employed to determine the effect of buoyancy on carbon dioxide solubility. The solubility measurements are presented as a function of temperature and pressure. An extended Henry's law equation was used to correlate the present experimental solubility values and the result was satisfactory.