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Original Research Article

In Vitro Study of Solubility of Carbon Dioxide in Diethyl Ethanolamine in the Presence of Calcium Carbonate Nanoparticles

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ABSTRACT

In this study carbon dioxide solubility in diethyl ethanolamine (DEEA) solvent with and without the presence of calcium carbonate nanoparticles at concentrations of 10, 15 and 20 wt% solvent in the pressure range of 5, 10 and 15 bar and titanium oxide, respectively. At concentrations of 0.05 and 0.1 wt% were measured at ambient temperature. The results show that at constant pressure (10 bar) and without the presence of nanoparticles, the solubility for the concentration of 10 to 15 wt% of the solvent increases from 26.03 v/v* to 42.28 v/v*. Increasing the pressure also increases the solubility. For a constant concentration (15 wt% of the solvent), the solubility increases from 24.38 v/v* to 34.66 v/v* by increasing the pressure from 10 to 15 times. So that for the constant concentration of solvent (15%) and constant pressure (15 bar) the solubility of carbon dioxide for the nanoparticles increases from 0 to 0.1

Keywords: Solubility, Calcium Carbonate Nanoparticle, Carbon Dioxide, Diethyl Ethanolamine