# Experimental Study and Modeling of $CO_2$ Solubility in Aqueous Solutions of Three Blended Amine (MEA, DIPA and AMP) Using Electrolyte-NRTL model

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Alkanolamine as a chemical solvent is widely used in an absorption process for removal of acid gases from natural, refinery and synthesis gases. Some kinds of these solvents are primary, secondary, tertiary, steric hindrance amines and their binary mixtures. Among them, MEA (Monoethanolamine) and DIPA (Diisopropanolamine) is widely used as the solvent for the carbon capture and sequestration (CCS). And AMP (2-amino-2-methyl-propanol) is utilized as a stable amine for high $CO_2$ absorption capacity. In this study, equilibrium solubility characteristics of $CO_2$ in Three Blended Amines (MEA, DIPA and AMP) and their mixtures were evaluated by using experimental data and thermodynamic models. The solubility of $CO_2$ was measured at 50, 60, 100, 110 ℃. To consider the non-ideality, activity coefficient model, The Electrolyte-NRTL(Non-Random Two-Liquid) model is applied and used to estimate interactions between molecule and ion species in the liquid phase. Calculations and optimizations (parameter regression) were conducted by MATLAB® 2020a version.