

## Binary Equilibrium Behavior for the N,N-Dimethylaniline and N,N-diethylaniline in Supercritical Carbon Dioxide

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The thermodynamic equilibrium properties for the two-component mixture of N,N-dimethylaniline and N,N-diethylaniline in supercritical CO<sub>2</sub> were reported. Data determinations were performed through the static-type method from (313.2 to 393.2) K and  $p = (4.70 \text{ to } 24.90)$  MPa. The obtained results indicated that the solubility of supercritical CO<sub>2</sub> was found to increase monotonically with the augmented of system temperatures and mole fraction of (N,N-dimethylaniline and N,N-diethylaniline) in binary (solute + solvent) mixtures. The solubility curve of N,N-dimethylaniline and N,N-diethylaniline in the CO<sub>2</sub> + N,N-dimethylaniline and CO<sub>2</sub> + N,N-diethylaniline systems increases as the temperature increases at a constant pressure. The CO<sub>2</sub> + N,N-dimethylaniline and CO<sub>2</sub> + N,N-diethylaniline systems exhibit type-I phase behavior. Moreover, experimental results of both systems were adequately correlated with the Peng-Robinson equation of state. RMSD for the CO<sub>2</sub> + N,N-dimethylaniline [ $k_{ij}=0.075$ ,  $n_{ij}=-0.070$ ] and CO<sub>2</sub> + N,N-diethylaniline [ $k_{ij}=0.078$ ,  $n_{ij}=-0.070$ ] systems using two parameters determined at 353.2 K were 7.50 % and 7.08 %, respectively.