

## **Solubility Modeling of Diamines in Supercritical Carbon Dioxide Using Artificial Neural Network**

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**Abstract:** In this paper, ANN and semi-empirical equations has been applied for estimation of solubility in supercritical CO<sub>2</sub> for two diamines (1, 5-naphthalenediamine, and 4, 4'- diamino diphenylmethane). Since solubility in supercritical fluids strongly depends on three variables including temperature, pressure and density of supercritical fluid, these three inputs devoted to the network and semi- empirical equations. In this paper a comparative study between ANN and semi-empirical equation has been done. Results showed accuracy of ANNs is more than other method. ARD for ANNs is 1.5% but semi-empirical equations have ARD about 5% and higher. Accuracy of Jouyban et al equations is more than other studied semi-empirical equations.

**Key word:** Diamines; Solubility; Supercritical carbon dioxide; Semi-empirical equation; artificial neural network (ANN).