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Modelling of Carbon dioxide solubility in different blends of ionic liquids with amines and diluents using five different statistical correlations and neural networks

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The present work proposes five statistical correlations to predict CO_2 solubility in 19 systems of ionic liquid blends with amines (primary, secondary, tertiary, etc), with other ionic liquids, with diluents such as water, ethanol, etc. over a wide temperature range of 298-353.15 K, pressure range of 49.8 to 6200 kPa and solubility of 0-0.487 mole fraction. The work is also extended by using 36 different combinations of training and learning algorithms using neural networks and the best possible combinations. The work for neural network is done for 22 systems of ionic liquid blends with amines presented. The main rewards of the models studied in the present work are simplicity and least input data, specifically temperature and pressure. The model fitting performance was analyzed calculating percentage absolute average relative deviation (%AARD) and correlation coefficient (R).