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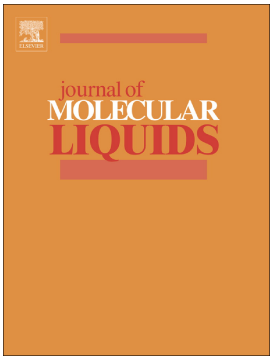

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A simple correlation for determining ionic liquids surface tension

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Abstract

Nowadays, Ionic liquids (ILs) are considered as new solutions with novel and effective applications, therefore, determining their physical and chemical properties are very important. In this paper, it has been tried to present a novel and simple correlation to predict surface tension of ILs. To this purpose, one of the most powerful techniques of soft computing, Multi-Gene Genetic Programming (MGP), has been used to generate a network and to obtain a simple and accurate correlation. Reduced temperature (T_r), reduced pressure (P_r), critical compatibility factor (Z_c) and acentric factor (ω) values have been selected as input parameters of the network. The obtained correlation has a simple mathematical form, which is a function of reduced temperature with a good accuracy (R^2=0.99). This correlation has three coefficients, which can be determined using GA or a simple curve fitting or can be found in this paper for some of the important ionic liquids. The other proposed method for determining the coefficients is to use six correlations that were presented in this work.

Keyword: Ionic Liquids; Surface Tension; Multi-Gene Genetic Programming; Correlation

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