

Application of Flory Paterson's Theory on the Volumetric Properties of Liquid Mixtures: 1,2-Dichloroethane with Aliphatic and Cyclic Ethers

Authors : Linda Boussaid, Farid Brahim Belaribi

Abstract : The physico-chemical properties of liquid materials in the industrial field, in general, and in that of the chemical industries, in particular, constitutes a prerequisite for the design of equipment, for the resolution of specific problems (related to the techniques of purification and separation, at risk in the transport of certain materials, etc.) and, therefore, at the production stage. Chloroalkanes, ethers constitute three chemical families having an industrial, theoretical and environmental interest. For example, these compounds are used in various applications in the chemical and pharmaceutical industries. In addition, they contribute to the particular thermodynamic behavior (deviation from ideality, association, etc.) of certain mixtures which constitute a severe test for predictive theoretical models. Finally, due to the degradation of the environment in the world, a renewed interest is observed for ethers, because some of their physicochemical properties could contribute to lower pollution (ethers would be used as additives in aqueous fuels.). This work is a thermodynamic, experimental and theoretical study of the volumetric properties of liquid binary systems formed from compounds belonging to the chemical families of chloroalkanes, ethers, having an industrial, theoretical and environmental interest. Experimental determination of the densities and excess volumes of the systems studied, at different temperatures in the interval [278.15-333.15] K and at atmospheric pressure, using an AntonPaar vibrating tube densitometer of the DMA5000 type. This contribution of experimental data, on the volumetric properties of the binary liquid mixtures of 1,2-dichloroethane with an ether, supplemented by an application of the theoretical model of Prigogine-Flory-Patterson PFP, will probably contribute to the enrichment of the thermodynamic database and the further development of the theory of Flory in its Prigogine-Flory-Patterson (PFP) version, for a better understanding of the thermodynamic behavior of these liquid binary mixtures

Keywords : prigogine-flory-patterson (pfp), propriétés volumétrique , volume d'excès, ethers

Conference Title : ICACEM 2022 : International Conference on Advanced Chemistry of Energetic Materials and Nitric Esters

Conference Location : Cairo, Egypt

Conference Dates : December 15-16, 2022