



Liquid Diffusion - Measurement and Correlation of Diffusion Coefficient in Acetic acid - Carbon tetra chloride System

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Abstract : The diffusion experiment was conducted involving the study of diffusivities of associating solute (Acetic Acid) in non associating solvent (Carbon Tetra Chloride), A New model equation for predicting diffusivities at infinite dilution has been derived for the case of associating solutes diffusing as dimmer. This model equation satisfactorily explains the wide discrepancy in predicting the diffusivities of such associating solutes by the conventional correlations proposed in the literatures. The model equation $D_{AB} = [D_{A1} + D_{A2} [\sqrt{(1 + 4KX_A)} - 1]]/\sqrt{(1+4KX_A)}$. The model parameter K remains nearly constant for the range of concentrations (up to 5%) studied, and that a mean value of K (290.85) could be used satisfactorily in the proposed model equation. The results also indicates that the conventional diapharm cells could be used satisfactorily for experimental determination of liquid diffusivities up to a concentration of 5%. The Cell constant is 0.3624. The experimental diffusivity is $1.4945 \times 10^{-5} \text{ cm}^2/\text{sec}$.

Keywords : Diffusivity, Acetic Acid - Carbon Tetra Chloride system, diapharm Cell, Associating solute, Model Parameter.

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