

Dielectric Relaxation Study of Ethanol in Benzene from Microwave Absorption Data

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The dielectric constant (ϵ') and dielectric loss (ϵ'') of dilute solutions of ethanol in benzene have been measured at 9.883 GHz at 25, 30, 35 and 40 °C using standard microwave techniques. The dielectric relaxation time (τ) and dipole moment (μ) at 25, 30, 35 and 40 °C have been calculated by using the single frequency concentration variation method suggested by Gopala Krishna. It is found that the dielectric relaxation process can be treated as a rate process like the viscous flow process. A monomer structure of C₂H₅OH in benzene solution has been inferred. Based upon these studies, the presence of solute-solvent associations has been proposed. The energy parameters for the dielectric relaxation process have been calculated and compared with the corresponding energy parameters of viscous flow.

Key words: Dielectric Relaxation; Ethanol; Benzene; Energy Parameters; Microwave Absorption.