



Dielectric Parameters and Intermolecular Interactions in Binary Mixture of Hydroxyl Groups in Polar Liquids

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ABSTRACT

A study of dielectric parameters like static dielectric constant, excess dielectric constant, dipole moment, relaxation time and Kirkwood correlation factor for the binary mixtures of ethylene glycol with ethanol of different concentration has been performed at microwave region to confirm the complex formation through hydrogen bonds. Dielectric behavior and dipole moment values of polar molecule binary mixtures were used to explore the molecular interactions between ethylene glycol and ethanol molecules at different concentrations. It is observed that relaxation time is very closely related with molecular parameters and molecular structure of these alcohols systematically change with number of carbon atoms and hydroxyl groups and their position in the molecules of polar liquids. We have developed the mixture of hydroxyl groups of binary compounds with specific concentrations and tried to study their dielectric properties and their molecular interactions. We have tried this prescription on various ionic, covalent and cross compounds also with different mixing proportions at certain temperature. This theory leads to explain the intermolecular behavior of crystals, which can be extended to interpret the molecular interactions of hydroxyl and amino groups in mixture of polar liquids. This approach has proved to be remarkably successful in the study of dielectric parameters of nano- materials. Certain industrial and technical applications are also suggested.

Keywords: Dielectric constant, Dipole moment, Kirkwood correlation factor, Relaxation time, hydrogen bond, Polar liquids.
