

# Dielectric Relaxation Studies of Binary Mixtures of Ethanol and Chlorobenzene in Benzene Solution from Microwave Absorption Data

Vimal Sharma and Nagesh Thakur

Department of Physics, H. P. University, Shimla – 171005, Himachal Pradesh, India

Reprint requests to V. S.; E-mail: vimal16sharma@yahoo.co.in

Z. Naturforsch. **63a**, 93 – 97 (2008); received August 9, 2007

Dielectric relaxation of different molar concentrations of ethanol ( $\text{C}_2\text{H}_5\text{OH}$ ) in binary mixtures of ethanol and chlorobenzene in benzene solutions has been studied at 9.883 GHz by using standard standing microwave techniques and Gopala Krishna's single frequency concentration variation method at different temperatures (25 °C, 30 °C, 35 °C, and 40 °C). It was found that the dielectric relaxation time varies linearly with variation in the molar concentration of ethanol in the whole concentration range of the binary mixture. Based upon these results the absence of solute-solute and the presence of solute-solvent type of molecular associations could be assumed. The energy parameters for the dielectric relaxation process of binary mixtures containing 50 mol% of ethanol have been calculated at the given temperatures. Comparison has been made with the corresponding energy parameters for viscous flow processes. It was found that the dielectric relaxation process can be treated as the rate process like the viscous flow process.

*Key words:* Dielectric Relaxation; Binary Mixtures; Ethanol; Chlorobenzene; Microwave Absorption.