

17. Pico-Second Technique For Dielectric Measurement Of Liquids

Yogesh S. Joshi, Kamalakar S. Kanse, M.P.Lokhande, Ashok C. Kumbharkhane

ABSTRACT

The picoseconds time domain reflectometry technique provides information regarding complex permittivity in the frequency range of 10MHz to 30GHz. The Tektronix model no. DSA8200 Digital Serial Analyzer sampling oscilloscope along with sampling module 80E08 has been used for measurement. The dielectric permittivity spectra of 2-alkoxyethanols with Polar and nonpolar liquids are measured at 25°C. The dielectric data were fitted to Cole-Davidson model. The static dielectric constant (ϵ_0), relaxation time (τ), dielectric constant at high frequency (ϵ_∞) and distribution parameter (β) were determined by using least square fit method. The Excess permittivity (ϵ_0^E) and Kirkwood correlation factor (g^{eff}) is calculated to obtain the information about H – bond complex formation. The maxima of ϵ_0^E at particular concentrations of binary mixtures suggest the formation of stable complex structure.