



Dielectric and viscosity studies of some Petroleum based lubricating base oils

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ABSTRACT

Dielectric constant (ϵ_0), dielectric constant at optical frequency (ϵ_ω) of some petroleum based lubricating oils in benzene for different weight fraction of oils (M1, M2, H1 and H2) have been experimentally measured. Values of density (ρ), viscosity (η) and free energy of activation for viscous flow (ΔF_η) of binary mixtures are reported. Further dipole moment (μ) by Onsager method, Kirkwood correlation factor (g) which is a dimensionless parameter has also been calculated. Excess properties like excess molar volume (V^E) and excess viscosity (η^E) were used to explain the nature of molecular interaction. Kinematic viscosity, viscosity index and percentage composition of aromatic, paraffinic and naphthenic carbon values are also measured and their values shows that lubricating oils manufactured from iso-dewaxing and hydro finishing (M1 and M2 samples) technologies is better than the base oils obtained from solvent extraction and hydro finishing technologies (H1 and H2).

Keywords: Dielectric constant, lubricating base oils, Kirkwood correlation factor, excess properties.
