

Study of molecular interaction in a polar-polar liquid mixture using ultrasonic route

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Abstract. The density, ultrasonic velocity and viscosity of an acidic organophosphoric extractant, di(2-ethyl hexyl) phosphoric acid (D2EHPA) with three monocarboxylic acids viz. acetic acid, propionic acid and n-butyric acid were experimentally measured over entire mole fraction range of D2EHPA at 303.15 K and at pressure $p = 0.1$ MPa. The experimental data were employed to compute the values of intermolecular free length, acoustic impedance, free volume, molecular association constant, deviations in intermolecular free length, acoustic impedance and free volume. The deviation of a physical property of the liquid mixture from its ideal behaviour facilitates in understanding the nature and extent of interaction between unlike molecules in the mixtures.

Keywords: Ultrasonic velocity; D2EHPA; monocarboxylic acids; binary mixtures; molecular interactions

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