# Studies of Viscosity and Excess Volume of Binary Mixtures. l. n-Propylamine + 1-Alkanol Mixtures at 303.15 and 313.15 K

S.L. Oswal and H.S. Desai
*Department of Chemistry*
*South Gujarat University*
*Surat 395 O07, India*

The excess molar volume $V^E$ , viscosity deviation $\Delta\eta$, excess viscosity $\Delta \ln \eta$, and excess Gibbs energy of activation $\Delta G^{*E}$ of viscous flow have been investigated from the measurements of the density $\rho$ and viscosity $\eta$ for seven binary mixtures of n-propylamine with ethanol, propanol, butanol, pentanol, heptanol, octanol and decanol over the entire range of mole fractions at 3O3.15 and 313.15 K. The results were fitted to variable degree of polynomials. The viscosity data have been correlated with the equations of Arrhenius, Kendall and Monroe, Bhagwat and Mandloi, Reed and Taylor, Grunberg and Nissan, Hind, McLaughlin and Ubbelohde, Tamura and Kurata, Katti and Chaudhri, McAllister, Heric and Brewer, and of Auslaender. The systems studied, exhibit very strong cross association due to strong H-bonding between -OH and $-NH_2$ groups. As a consequence of this strong intermolecular association all seven systems have relatively large negative excess volumes.