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## Determination Thermodynamic Properties for Hydrogen Bonded Complexes of Phenols with N-Methylaniline in N-Hexane Medium at Different Temperatures using Ultrasonic Technique

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**Abstract:** Acoustical and excess thermo acoustical properties of Phenol, 4-chlorophenol(4-ChP) with N-methylaniline (NMA) in n-hexane mixtures are investigated by measuring ultrasonic velocity ( $u$ ), density ( $\rho$ ) and viscosity ( $\eta$ ) in the concentration range 0.01-0.1M at atmospheric pressure at different temperatures 298K, 303K, 308K. The trend in the acoustical and excess thermo acoustic parameters reveals the existence of hydrogen bonded and charge transfer complexes between amines and phenol. The variation of the excess parameters both in sign and magnitude within the range of concentration investigated is also discussed in terms of structural aspect and functional groups of the components involved. The formation constants of the charge transfer complexes determined using Kannappan equation in ultrasonic method.

**Keywords:** excess parameters, phenols, N-methylaniline, n-hexane, ultrasonic technique, thermo acoustic parameters.

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