REVIEW OF LITERATURE:

The effect of molecular size, shape, chain length and degree of molecular association of normal and branched alkanols on the volumetric, viscometric, transport and acoustic properties of binary and ternary liquid mixtures containing methyl acetate, ethyl acetate, benzonitrile, dimethylsulfoxide, trichloromethane, N-N dimethylformamide and toluene.

Ali A. et al (2001) have studied the effect of intermolecular interactions in binary liquid mixtures of formamide with 2-Propanol and 1,2,3,-Propanetrol. [1]

Aminabhavi T. M. et al [1993] have measured densities and viscosities at 298.15, 303.15, 308.15 & 313.15 K for binary liquid mixtures of methyl acetoacetate with Methanol, Ethanol, 1-Propanol, 2-Propanol, 2-methyl-1-Propanol, 1-Butanol, 1-Pentanol, 1-Hexanol, 1-Heptanol and 2-octanol. Excess molar volumes and deviation in viscosities were calculated. These quantities were used to discuss the mixing behaviour of the components.[2]

Arbad B. R. et al (2005) have reported the excess molar volumes and deviation in viscosity of binary liquid mixtures of 2,4,6-trimethyl 1,3,5-troloxane +ethanol, 1-propanol and 1-butanol at 298.15K, 303.15K, 308.15K.[3]

Canose J. et al (1998) have reported the dynamic viscosity of binary liquid mixtures of methyl acetate with methanol, 2-methyl 2-butanol, at 298.15K. from these data, excess properties have been calculated.[4]

Desale Bhatu S et al (2007) have measured densities and viscosities of ternary liquid mixtures of propyl acetate with methanol and propan-1-ol at different temperatures and determined the thermodynamic and transport properties of binary liquid mixtures of propyl acetate with methanol, ethanol and propan-1-ol...normal alkanols at different temperatures. [5-6]

Farnandez J. et al(1983) have determined the thermodynamic and transport properties of binary liquid mixtures of Propyl acetate with methanol, ethanol and propan-1-ol... normal alkanols at different temperature. [7]

Gill D S et al (1993) have studied densities and viscosities of binary liquid mixtures of Benzonitrile with N-N DMF, methanol, acetone at 298.15 K. [8]

Gonzalez E. Et al (1993) have studied thermodynamic properties methyl ester with alkane at 298.15K. [9-10]

properties like excess molar enthalpy and excess molar volumes for ethyl acetate with n-alkane at 298.15K. [45]

Hasan M. et al (2006) have measured densities, viscosities and ultrasonic velocities of binary liquid mixtures of trichloromethane with methanol, ethanol, propanol and butanol at 298.15K and 308.15K. [12]

Iglesias M. et al (1998) have reported thermodynamic properties of mixtures containing methyl acetate with methanol, 1-butanol, at 298.15K by using ERAS model. [13]

Jionhua Hu et al (1977) have studied excess thermodynamic properties of binary liquid mixtures of ethyl acetate with benzene, ethanol and 2,2,2-trifluoroethanol at 298.15K and 308.15K. [14]

Jianhong Deng et al (2007) have measured the densities and surface tensions of propyl acetate with xylenes and ethyl benzene at 298.15K and 308.15K. [15]

Kadam U B et al (2006) have measured densities and viscosities of the binary liquid mixtures of chloroform with methanol, ethanol, 1-propanol, 1-butanol, 1-pentanol, 1-hexanol, 1-heptanol, 1-octanol, 1-decanol at 298.15K, 303.15K, 308.15K, 313.15K and reported that the excess molar volumes are positive for the binary liquid mixtures of chloroform with higher alkanols and in deviation in viscosities are negative for the binary liquid mixtures of chloroform with higher alkanols. [16]

Lorenzang M T et al (1989, 1990) have determined the thermodynamic properties of binary liquid mixtures of propyl acetate with n-alkane at 298.15K. [17-18]

Matos J. et al (1994) have presented the reports on the study of excess volume as a function of composition for binary liquid mixtures of methyl acetate + heptanes or nonane at 298.15K. The system showed positive-negative values of excess volume as a function of composition. [19]

Nikam P S et al (1998) have determined excess volumes of binary liquid mixtures of ethyl acetate with alkanols(C_{1}-C_{5}) from density measurement. Negative excess volumes for ethyl acetate + methanol was observed which may be due to interactions occurring between unlike molecules and positive for all remaining systems. The excess molar volumes and deviations in viscosities for the binary liquid mixtures of methyl acetate with linear and branched alkanols at 298.15K, 303.15K &308.15K have been reported by them. [20]

Nikam P S et al (1995) have measured densities and viscosities of binary liquid mixtures of acetonitrile with linear and branched alkanols [C_{1}-C_{4}] over the entire composition range at 298.15K, 303.15K & 313.15K. The excess molar volumes and deviations in viscosities were calculated and data were fitted to a Redlich-Kister polynomial. [21]
Nikam P S et al (2000) have measured densities and viscosities of binary liquid mixtures of toluene with methanol, ethanol, 1-propanol and 1-butanol. [23]

Nikam P S et al (2000) have measured molecular interactions of aniline with C\textsubscript{5}-C\textsubscript{10} alkanols at different temperature. [24]

Nikam P S et al (2000) have reported densities and viscosities of binary liquid mixtures of benzonitrile with methanol, ethanol, 1-propanol, 1-butanol, 2-methyl-1-propanol and 2-methyl-2-propanol at 298.15K & 303.15K. From these results, the excess molar volumes and deviations in viscosities have been computed. These properties were used to calculate regression coefficients of the Redlich-Kister equation. [22]

Nikam P S et al (2003) have calculated excess molar volume and deviation in viscosity of binary liquid mixtures of N-N dimethyl formamide with aniline and benzonitrile at different temperature. [25]

Ortega J. et al (1993, 2002) have reported the thermodynamic properties of binary liquid mixtures of propyl ester with alkanols at 298.15K [39-40]. Similar thermodynamic properties for methyl acetate with n-alkane and n-alkene have been reported by Ortega J. and Gonzalez at different temperatures. [29-31]

Oswal S L et al (1984, 1998) have determined the excess molar volumes from experimental density of binary liquid mixtures of methyl acetate, ethyl acetate and n-amyl acetate with n-hexane, tetrachloromethane, trichloromethane and iso-arnyl acetate with carbon tetrachloride and chloroform. These results were fitted to polynomial relations and analysed in terms of disruption if dipolar association of ethyl acetate and molecular interactions between alkyl acetate and chloromethane. [26-27]

Oswal S.L. et al (1984) have measured viscosities of binary liquid mixtures of ethyl acetate with toluene at303.15K. Excess viscosities and excess free energies of activation of flow were calculated from experimental data. They have also reported the densities and excess volumes for four binary solutions of ethyl acetate +toluene, ethyl acetate +ethyl benzene, ethyl acetate + carbon tetrachloride and ethyl acetate + chloroform at 303.15K. The excess volumes for binary liquid mixtures of ethyl acetate + ethyl benzene and ethyl acetate + carbon tetrachloride are small but positive whereas for ethyl acetate + toluene, it is negative. For ethyl acetate + chloroform the volumes have S-shaped curve. They have also measured excess volumes for binary liquid mixtures of toluene with ethyl acetate as a function of composition at 303.15K. At higher mole fractions of toluene, the excess volumes are positive. [28]
Pal A. et al (1995, 1997, 2001) have determined the volumetric properties of n-alkoxyethnol with methyl acetate at 298.15K temperature. [32-34]. Van Ness et al (1967) have reported excess molar volume for the system acetone + carbon tetrachloride, +chloroform, +ethylene chloride and for (ethylene chloride + methyl acetate). The first two steps of the system showed positive-negative values of excess molar volumes as a function of composition. [44]

Palaiologou M. M. et al (1995) have measured excess molar volumes for binary liquid mixtures of ethyl acetate with toluene and its ortho and para chloro derivatives. From density measurement, negative excess molar volumes for all systems was observed which may be due to the interactions occurring between unlike molecules which were stronger than the interactions between like ones and complex formation between free electrons of carboxylic group of ester and aromatic ring. [35]

Pei-Juhg-Lien. et al (2004) have reported the excess molar enthalpies of binary liquid mixtures of propyl ester with ethanol, 1-propanol, benzene, cyclohexane and heptanes at 318.15K. [36]

Rodriguez A. et al (1998) have measured dynamic viscosities and densities of methyl acetate with methanol, 1-propanol, 2-butanol at 298.15K. From these data, Rodriguez derived excess properties of the system and calculated the standard deviation from derived viscosity. [37]

Saravankumar K et al (2012) have studied the thermophysical and acoustical properties of acetophenone and propyl acetate. [41]

Savale T S et al (2010) have determined densities and viscosities of binary mixture of xylenes (ortho, meta and para) with propan-1-ol at 298.15 K, 303.15 K, 308.15 K, 313.15 K. [40]

Shivkumar K. et al (1997) have calculated excess molar volume for binary liquid mixtures of 1,1,1-trichloroethane with ester at 303.15K. [39]

Treszezanowicz A. J. et al (1981) have reported excess molar volumes of binary liquid mixtures of n-alkane with decanol, n-pentane, n-hexane, n-octane, n-decane and n-hexadecane at 298.15K [42]. The molar volumes of substituted benzene with N, N dimethyl formamide at 303.15 K and 313.15 K were also reported by Ramadevi R.S. et al in, 1996. [37]

Toledo-Marante F. J.et al (2000) have determined the thermodynamic properties for butyl acetate with n-alkane at 298.15 K.[43]
Venkatesulu D.V. et al (1997) have measured excess molar enthalpies of binary liquid mixtures of ethyl acetate and butyl acetate with 2-alkoxyethanols at 298.15K.[46]