Vapor-Liquid Equilibrium for Binary Mixtures of Methanol with Other Alcohols

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Mixtures of aliphatic alcohols are extensively used in the petrochemical and chemical industries. These are also used as heat transfer agent and refrigerants. It is thus desirable to know their thermodynamic properties over a wide range of state parameters. Although a number of studies on the thermodynamics of alcohol mixtures are found in literature, there is still a need to investigate further mixtures especially the mixtures of methanol with other alcohols. One of us (MB) has reported the thermal conductivities and the heat capacities of the mixtures of methanol with other alcohols. In this study we report the isobaric vapor-liquid equilibrium (VLE) data for three binary systems formed by mixing methanol with n-hexanol, n-heptanol and n-nonanol at p = 101.325 kPa. A dynamical equilibrium apparatus has been used to establish the equilibrium between the phases. After attainment of equilibrium the boiling temperature and the compositions of the vapor and the liquid phases are determined. The refractive indices of the samples have been used to determine the compositions of vapor and liquid phases. The experimental binary data have been tested for thermodynamic consistency. The non ideality of vapor phase was considered and the activity coefficients were correlated with Wilson, NRTL and UNIQUAC equations and the parameters determined. UNIFAC method was used for predictions.