Vapor-Liquid Equilibria of Alcohol-Chlorobenzene Mixtures

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Most of the isobaric binary vapor-liquid equilibrium (VLE) data on alcohol-chlorobenzene binary systems have been measured in dynamic still and reported from our laboratories. These are:

methanol(1) –chlorobenzene(2)
ethanol(1) - chlorobenzene(2)
2-proponol(1) -chlorobenzene(2)
n-propanol(1) -chlorobenzene(2)
n-butanol(1) - chlorobenzene(2)
2-methyl-2-propanol(1) - chlorobenzene(2)
2-methyl-1-propanol(1) -chlorobenzene(2)
2-butanol(1) - chlorobenzene(2)
chlorobenzene(1)-3-methyl-1-butanol(2)
chlorobenzene(1) - n-pentanol(2)

A few isothermal and isobaric VLE data sets for some of the alcohol-chlorobenzene systems are available in literature. All these data have been compiled and checked for thermodynamic consistency and the accuracy of the data are established. Using six different optimization procedures, the data of each system have been correlated by 25 activity coefficient models. The model parameters along with RMSD values in P and y are presented. Moreover, the predictability of two popular group contribution methods, UNIFAC and ASOG are tested for these mixtures. The figures showing comparisons of all the results are presented.

The experimental limiting activity coefficient data for the above systems except for the methanol-chlorobenzene system were also measured and reported. The limiting activity coefficients calculated from the VLE data and other predictive methods for all the systems studied in the present work are compared. The VLE data predicted from the limiting activity coefficients and the azeotropic data for each system are also compared.