

CHE221: Chemical Engineering Thermodynamics

Computation Assignment Report

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Aim: Our main aim in this computational assignment is to compute equilibrium vapour concentration of a vapour liquid equilibrium of a given mixture of 2 Butanol and 1,3,5 Trimethylbenzene using the modified raoult's law with activity coefficients computed using the van Laar's model, given as:

$$\ln(\gamma_1) = A_{12} \left(\frac{A_{21}x_2}{A_{12}x_1 + A_{21}x_2} \right)^2$$

$$\ln(\gamma_2) = A_{21} \left(\frac{A_{12}x_1}{A_{12}x_1 + A_{21}x_2} \right)^2$$

The saturated vapour pressure of the liquids is given by the following Antoine's Equation:

$$\log(P_1^0) = A - \frac{B}{t + C}$$

Where A,B & C are antoine's constant and t(°C) is the given temperature.

The Vapour concentration are calculated from modified raoult's law as:

$$y_1 = \frac{P_1^0 \gamma_1 x_1}{P}$$

Here P = 760 mm of Hg

Plots:



