

## SYNOPSIS

In Chapter 1, a set of semiempirical vapor pressure equations are developed for both low pressure and high pressure regions on the basis of <sup>the</sup> ~~Radlich~~ Radlich-Kwong equation of state.

In Chapter 2, pertinent literature on thermodynamics of vapor-liquid equilibria of liquid-mixtures is reviewed from 1964 to 1968 (the literature upto 1964 is reviewed in the previous doctoral theses of these laboratories). *and elsewhere!*

In Chapter 3, equations for boiling point isobars of binary systems are developed on the basis of regular solution concept.

In Chapter 4, a set of equations for the prediction of binary and ternary azeotropes are developed making use of the Wilson correlating equations.

In Chapter 5, a thermodynamic test method for ternary systems is developed using Lagrangian interpolation formula.

In Chapter 6, a vapor recirculatory equilibrium still (used for vapor-liquid equilibrium determinations) and its operating procedure are described.

In Chapter 7, vapor-liquid equilibrium data of 1-propanol-n-heptane, 1-propanol-methylcyclohexane, 1-propanol-p-dioxane

and methylcyclohexane-1-butanol systems are reported. These are tested and correlated.

In Chapter 8, equilibrium data of p-dioxane-1-propanol-water system are given. These are also tested and correlated.

In Appendix 1, a programme for the evaluation of the Wilson binary parameters is developed.

In Appendix 2, a programme for estimating activity coefficients of ternary systems is given.

In Appendix 3, physical properties of the liquids used are given with literature values.

At the end of the thesis, a general nomenclature is added.