CHAPTER VII

CONCLUSION AND RECOMMENDATION

a) The binary interaction coefficient, K_{ij}, is necessary for better VLE prediction at high pressure. For the K_{ij} in the Leiva EOS, its value decreased as the temperature increased. The K_{ij} for N2-hydrocarbon binary is more dependent on temperature than those for hydrocarbon-hydrocarbon and CO_2 - hydrocarbon binaries.

b) The Leiva equation offered good applicability at low tempera ture, however, at high temperature, VLE prediction slightly degenerated in the neighborhood of the critical point. The Leiva equation predicted more accurate bubble point pressures for hydrocarbon-hydrocarbon and CO_2 - hydrocarbon systems than that for N_2 - hydrocarbon system. Accuracy in VLE prediction by the Leiva EOS decreased as the number of components increased. Accuracy also decreased when N_2 and CO_2 were included in the hydrocarbon system.

c) Comparative study of the Leiva equation and SRK equations revealed that both equations gave excellent VLE prediction, but at high temperature the Leiva equation was superior to the SRK equation.

At high pressures near the critical point, calculation of bubble point pressure is time consuming. When using the Leiva equation, the number of iterations, and thus computing time was reduced considerably. Besides, the SRK equation gave unrealistic bubble point pressure near the critical point region.

d)   Compared to the SRK equation, the Leiva equation gave much better value of the liquid molar volume. While the SRK equation gave similar results for vapor molar volume prediction.

RECOMMENDATION

For systems that include nitrogen, the above calculatons clearly show the limitations of the EOS method in the form in which is possible to treat such systems by including association into the EOS procedure.