

## CHAPTER V

### CONCLUSION AND RECOMMENDATIONS

#### 5.1 Conclusions

The multistage foam fractionation of rinse water containing surfactant was investigated in a continuous flow operation. Effects of several important parameters such as influent concentration, air and liquid flow rate, foam heights, tray spacing, feed position and recycle ratio were examined using Cetylpyridinium chloride (CPC) as a model cationic surfactant. The performance of the fractionation column was evaluated in two aspects: the surfactant recovery (%) and the enrichment ratio. The surfactant recovery obtained in this column was in the range of 80-95% whereas the enrich in this column was in the range of 2-20. The influence of the system parameters could be concluded as follows:

1. Increasing liquid feed flow rate resulted in both decreases in the enrichment ratio and % surfactant recovery.
2. An increase in air flow rate resulted in a reduction in the enrichment ratio but the surfactant recovery was increased.
3. The rate of surfactant recovery did not change with increasing foam height but has more positive impact on enrichment ratio.
4. The rate of surfactant recovery increased with surfactant feed liquid concentration but enrichment ratio decreased as feed liquid surfactant concentration increased.
5. When increasing number of trays both surfactant recovery and enrichment ratio were increased.
6. When increasing the recycle ratio, both percent surfactant recovery and enrichment ratio did not change but the highest enrichment ratio was obtained when the feed was fed to higher trays.

## 5.2 Recommendations

1. Increasing number of bubble cap on each tray is recommended for further study in order to improve the mass transfer in the fractionator.

2. Other types of surfactants, or mixed surfactants may be used to broaden understanding and applicability of the multistage foam fractionation column in surfactant recovery.