

## CHAPTER V

### CONCLUSION AND SUGGESTION

#### 5.1 Conclusion

##### 5.1.1 Study the Phase Behavior of Ternary Liquid System for IPA – Water - Cyclohexane .

The results show that the solubility of IPA in CHX – water mixtures increased with increasing temperature. The plait point compositions of IPA– water – CHX mixtures at temperatures of 26°C and 30°C were not different because the temperature may be closed. Therefore the temperature did not affect the compositions at plait point. The compositions of plait point are as follows:

Compositions (%)	26°C	30°C
IPA	27.1	27.6
Cyclohexane	47.1	46.7
Water	25.9	25.7

##### 5.1.2 Study of Operating Condition of IPA Dehydration Process by Heterogeneous Azeotropic Distillation.

According to the results, it was found that increasing feed rate also need the increase of percent reflux rate. It can be explained that when increasing feed rate, the amount of CHX, which used as the entrainer, should also be increased. Until the percent reflux rate increased to the optimum point, after that the increase of percent reflux rate would not affect to distillation efficiency.

The relationships between feed rate and reflux rate that lead to high percentage of IPA and low percentage of CHX in product show that percentage of CHX in product decreased with increasing percent reflux rate. Therefore, the

optimum reflux rate should be at 98% because this percent reflux rate (98%) for every feed rate, it found that percentage of IPA in product is more than 99% and percentage of CHX in product is lower than 0.002%.

At the optimum condition, the vapor compositions at top of column were calculated by material balance method. The results found that the composition of vapor (top product) is close to the CHX phase compositions. The results are as follows:

	Compositions(%)		
	IPA	CHX	Water
Vapor	12.13	84.16	3.71
CHX phase	13.22	84.66	2.12

## 5.2 Suggestion for Future Work

- 5.2.1 The heterogeneous azeotropic distillation should be further studied by varying other parameters, e.g. temperature of the azeotropic distillation column.
- 5.2.2 The longer experimental time should be studied to maintain the steady state operation.

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