CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Polyimide was the most suitable material for casting membranes to investigate the performance of paraffins, olefins and C_8-aromatics separation because of its stability and strength. The extraction and pervaporation techniques were used for testing the polyimide membrane and polyimide-based MMM's. From the extraction unit, the results showed that both polyimide membrane and polyimide-based MMM's were selective for the C_8-aromatics than n-paraffins. Furthermore, consideration among the C_8-aromatics showed that all membranes were selective for ethylbenzene, p-xylene, and m-xylene than o-xylene.

The results from the pervaporation unit were also investigated. The comparison between n-paraffin and n-olefin showed that both polyimide and polyimide-based MMM's were selective for n-paraffin over n-olefin. While the separation between n-paraffin and the C_8-aromatic showed that all membranes were selective for the C_8-aromatic over n-paraffin, which was consistent to the results from the extraction unit. However, the separation among the C_8-aromatic isomers from the extraction and pervaporation units were so low that it was negligible and the temperature hardly affected the separation.

5.2 Recommendations

Other factors that affect membrane selectivity such as types of polymer and desorbent in the extraction unit, the concentration of the feed, and the concentration of the adsorbent in the MMM's are worth investigating. Moreover, the mechanism of the molecular permeation needs further investigation.