



CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

All mixed matrix membranes were prepared by the solution-casting method and were tested for permeability and selectivity of CO₂/N₂ at room temperature.

The selectivities of PEG/SIL MMM were significantly improved due to the hydroxyl groups, present in each of PEG molecules, could enhance solubility coefficient of CO₂ through the membrane materials. The CO₂/N₂ selectivity increased as the concentration of PEG in the membrane increased. For the membrane with glycerol-treated polysulfone, the selectivity was further improved.

In the case of Act.C/SIL MMM, the selectivity was also increased. Besides, the higher selectivity was obtained by incorporating PEG with activated carbon in PEG/Act.C/SIL MMM to prevent the leak out of PEG from the surface of the membrane.

To further enhance the selectivity, K₂CO₃ was first impregnated into activated carbon before ad-mixing the casting solution. The controlling mechanism was facilitated transport mechanism. In addition it was found that there was no effect of %RH in gas feed stream from 30 to 70% on the permeability and the selectivity of CO₂/N₂.

5.2 Recommendations

From this work, it was found that the permeability of PEG/SIL MMM could be improved by adding activated carbon into the membrane. Therefore, further study by focusing on this type of membrane should be done in the future.