

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

All mixed matrix membranes were prepared by solution-casting method and investigated the plasticization by evaluated the single gas permeation rates of CO₂, CH₄ and N₂ at room temperature and a constant pressure between 25 and 250 psia. Thermal treatment, NaX-zeolite and the combination of these two parameters were used to suppress the plasticization.

The thermal treatment around the glass transition temperature (T_g) can effectively suppress the plasticization in MMMs.

The incorporation of NaX-zeolite has the positive effect in plasticization suppression. For CA supporting MMMs, the ability in plasticization suppression increase with increasing amount of NaX-zeolite. Moreover, the PEG treated NaX can further improves the plasticization suppression. For CA powder MMMs, 10% NaX loading was the optimum amount to reduce the plasticization.

The combination of thermal treatment and NaX-zeolite can further improve the ability of CA supporting MMMs to suppress the plasticization. For CA powder MMMs, the thermal treatment was obvious effect in plasticization suppression.

5.2 Recommendations

From this work, it was found that the incorporation of NaX-zeolite had the positive effect in plasticization suppression. Therefore, further study by focusing on types of zeolite should be done in the future.