CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

In this work, polyimide membrane and three MMM's including polyimide and different silicalite-1 loadings (10, 20 and 30 wt %) were prepared by solution casting and solvent evaporating methods. Pervaporation technique was carried out. The results showed that all membranes were selective to *p*-xylene over *o*-xylene and selective to C_8 aromatics over paraffins. The permeability of *p*-xylene increased with increasing silicalite-1 loading. Despite the high permeability of *p*-xylene, *p*-/*o*-xylene selectivity was rather low. Moreover, silicalite-1 permitted *p*-xylene diffuse through at a faster rate than the others. Silicalite-1 enhanced both *p*-/*o*-xylene separation and C_8 aromatics/paraffins separation. The adsorption of *p*-xylene and *o*-xylene in the pores of silicalie-1 seemed to inhibit the permeability of paraffins.

5.2 Recommendations

There are many factors affecting membrane selectivity. Further study may involve different types of zeolites and polymers. Making good membranes without any defects and interfacial voids are also critical. It is possible to make interfacial void-free zeolite filled glassy polymer mixed matrix membranes by filling the space between zeolite particles and polymer chains with low molecular weight materials, which could interact simultaneously with zeolites and polymers.