

CHAPTER IV

CONCLUSION AND SUGGESTION FOR FUTURE WORK

4.1 Conclusion

Metal-containing epoxy polymers have been prepared from crosslinking reaction of DGEBA with tetradentate Schiff's base metal complexes and maleic anhydride. The presence of maleic anhydride decreased the crosslinking time and also improved the thermal and mechanical properties of the epoxy polymers. The metal complexes used in this work were tetradentate Schiff's base complexes of copper, cobalt, nickel and zinc. From the investigation of thermal properties and tensile strength of the epoxy polymers, it was found that the presence of Bu_4NOH (20 mole% of the metal complexes) as a catalyst was essential to decrease the crosslinking time and improve polymer properties. Metal-containing epoxy polymers obtained from the equimolar ratio of metal complexes and maleic anhydride had good thermal and mechanical properties. Cu- and Zn-containing epoxy polymers obtained at the mole ratio of ML : MA : DGEBA = 0.2 : 0.2 : 1 possessed the best properties. However, the preparation of Cu-containing epoxy polymers was more facile than Zn-containing epoxy polymers since lower crosslinking temperature could be employed.

4.2 Suggestion for Future Work

There are still many aspects that require further investigation regarding the preparation of epoxy polymers by hand casting. The crosslinking temperature can be reduced. Although the crosslinking time will increase, the lower crosslinking temperature is preferred to prevent the polymer decomposition. The amount of Bu_4NOH in the formulation can be increased to reduce the crosslinking time.

Furthermore, use of the liquid acid anhydrides to improve the compatibility with metal complexes and DGEBA can also be employed.