CHAPTER IV

CONCLUSION AND SUGGESTIONS FOR FUTURE WORK

4.1 Conclusion

Hexadentate Schiff base zinc and nickel complexes have been synthesized. The chemical structures of metal complexes were identified by IR spectroscopy. The metal-containing polyurethane-ureas and copolyurethane-ureas have been synthesized. The progress of polymerization reaction was investigated by IR spectroscopy. The ^{1}H NMR spectra of metal-containing polyurethane-ureas showed a signal of N-H protons of urethanes (-NHCOO-) and urea (-NHCONH-) groups around 8.5-8.6 ppm. The elemental analysis of metal-containing polyurethane-ureas showed that the percentage values of carbon, hydrogen and nitrogen were within the range of calculated values. The polymers were insoluble in most organic solvents and were soluble in DMSO and DMF and chlorinated solvent such as CH_2Cl_2 and $CHCl_3$. When % metal-containing in polyurethanes was increased, the inherent viscosity also increasing. The $NiSal_2$trien-based polyurethanes had higher inherent viscosity more than $ZnSal_2$trien-based polyurethanes.

Thermal properties of metal-containing polyurethane-ureas and copolyurethane-ureas were investigated by using thermogravimetric analysis (TGA). From TGA study, when the wt % of metal complexes in polymer was increased, the % weight loss of polymer decreased at high temperature. In comparison to metal-containing polyurethane-ureas, metal-containing copolyurethane-ureas showed less % weight loss. Flame retardancy of metal-containing polyurethane-ureas and copolyurethane-ureas increased when wt % metal complexes in the polymers was increased. The flame retardancy of metal-containing copolyurethane-ureas was higher than those of polyurethane-ureas.

4.2 Suggest for future work

The suggestion for future work is to synthesize metal-containing polyurethane-ureas and copolyurethane-ureas with different derivatives of $MSal_2trien$ and prepolymers. Moreover, the different transition metal complexes should give different property of metal-containing polyurethane-ureas and copolyurethane-ureas. Therefore, future research could also concentrate on the synthesis of metal-containing polyuretane-ureas and copolyurethane-ureas based on different transition metal complexes.