CHAPTER V

CONCLUSION AND SUGGESTION FOR FUTURE WORK

5.1 Synthesis of metal-containing polyurethane-ureas and copolyurethane-ureas

Hexadentate Schiff base metal complexes (ML, where M= Zn^{2+} and Ni^{2+}) were synthesized and used in the synthesis of polyurethane-ureas and copolyurethane-ureas.

The synthesized metal-containing polyurethane-ureas (ML-PUU) and copolyurethane-ureas (ML-coPUU) were characterized by IR and NMR spectroscopy. From the elemental analysis data of ML-PUU and ML-coPUU, it was found that the percentage value of carbon, hydrogen and nitrogen were within the range of calculated values.

5.2 Solubility

The solubility of metal-containing polyurethane-ureas and copolyurethane-ureas was tested in various solvents. All polymers were soluble in DMF and DMSO but some polymers were insoluble in methanol, CH_2Cl_2, THF and $CHCl_3$.

5.3 Viscosity

The inherent viscosity of metal-containing polyurethane-ureas and copolyurethane-ureas was examined using DMSO as a solvent at 40 °C. It was found that the value was in the range of 0.06319-0.26960 dl/g.

5.4 Thermal property

Thermal and flame retardant properties of metal-containing polyurethane-ureas and copolyurethane-ureas were investigated by using thermogravimetric analysis and measuring limiting oxygen index (LOI), respectively. Among all the polymers, the NiL-MDI (1:2) was found to be the most thermally stable polymer. The LOI values of the polymers were in the range of 21.4-24.3.

5.5 Suggestions for future work

Since it was found that thermal stability of metal-containing copolyurethane-ureas was improved upon the addition of *m*-xylylenediamine in the polymerization, the suggestion for future work is to use different aliphatic and aromatic diamines in the preparation of copolyurethane-ureas. Aliphatic and aromatic dialcohols could also be used in the preparation of copolyurethane-ureas which in this case, the solubility of polymers in organic solvents should be improved.