

CHAPTER IV

CONCLUSIONS AND SUGGESTIONS FOR FUTURE WORKS

4.1 Conclusions

4,4'-Dihydroxysaltrien metal complexes (ML, where M = Zn, Ni, Co and Mn) have been synthesized and characterized. The chemical structures of metal complexes were identified by IR and NMR spectroscopy, elemental analysis and mass spectroscopy. It was found that CoL and MnL were unstable and they could not be used in the synthesis of metal-containing polymers. Polyurethane-ureas containing 4,4'-dihydroxysaltrien Ni and Zn complexes in polymer chain were synthesized and characterized in order to obtain the information on reactivity of –NH and –OH groups in the metal complexes towards isocyanate group. Nickel and zinc-containing copolyurethane-ureas have also been synthesized and characterized. The polymerization mechanism could be concluded that –NH and –OH groups in the metal complexes and –NH group of xylylenediamine reacted with isocyanate group of prepolymer and the repeating unit of obtained polymer is random. The progress of polymerization reaction was investigated by IR spectroscopy. The polymers were characterized by IR spectroscopy and solubility. It was found that all polymers were soluble in DMF and DMSO. Thermal stability of metal-containing polyurethane-ureas and copolyurethane-ureas was investigated by TGA. It was found that polymers based on NiL exhibit higher stability than zinc-based polymers. Among the copolyurethane-ureas, thermal stability increased when the amount of ML in the polymer chain was increased.

4.2 Suggestions for future works

The suggestion for future work is to synthesize 4,4'-dihydroxysaltrien metal complexes with different metal acetates. The obtained metal complexes can be used in the synthesis of polyureas or polyurethane-ureas with different various isocyanate derivatives to improve thermal property.