CHAPTER I

INTRODUCTION

Polyurethane has been known for their commercial acceptance in the industry due to the diversity of their properties and technologies.

Polyurethane-ureas possess excellent mechanical and physical properties, high combustion resistance and high wear resistance. These polymers are widely applicable to a number of industrial products including elastomers, fibers, foams, adhesives, coatings and paints. The incorporation of metal into the polymer backbone has led to wide applications such as aqueous thickeners, coatings, textile seizers, adhesives, catalyst and additives because the interaction between polymer with coordination group and metallic ions gives them the numerous interesting properties such as high strength and thermal stability.

This research involves the synthesis of metal-containing copolyurethane-ureas from zinc and nickel 4,4′-dihydroxysaltrien metal complexes (ML), 4,4'-methylene*bis*(phenyl isocyanate) (MDI) and various diamines or dialcohols, namely methylenedianiline (MTDA), hexamethylenediamine (HMDA), bisphenol A (BA) and 1,6-hexanediol (HD), using dibutyltin dilaurate (DBTDL) as a catalyst. Series of polyurethane-ureas with different compositions were prepared by taking the molar ratio of ML:MDI:diamines or dialcohols as 1:2:0, 0.5:3:1.5, 1:3:1 and 1.5:3:0.5 to study the effect of diamines and dialcohols content on the properties of the polymers. Blank polyurethane-ureas without metal complexes were also prepared by the reaction of MDI with diamines or dialcohols to study the influence of metal on the thermal property. It was expected that these copolyurethane-ureas would show good thermal stability, excellent solubility and can be utilized in high temperature application.