Objectives of the present work

A. One of the objective of the present work is to systematically examine a series of aliphatic-aromatic polyesters with a view to understand the structure relationship between monomer and polyester properties.

B. To synthesize various cycloaliphatic diols and diesters with varying degrees of molecular rigidity.

C. To synthesize a series of copolyesters of dimethyl terephthalate with different cycloaliphatic diols and diesters.

D. To synthesize aliphatic polyesters containing cycloaliphatic diols and diesters.

E. To study the thermal and dynamic mechanical properties of the polyesters and copolyesters.

F. To study the crystallization behavior and the crystallization kinetics of the copolyesters.

The thesis has been divided into the following chapters:

Chapter 1 : Introduction

A general literature background is presented on the influence of comonomer structure on the properties of aliphatic-aromatic copolyesters, with particular reference to thermal properties and crystallization phenomena.

Chapter 2: Scope and objectives of the present work.

This chapter discusses the scope and objectives of the present work.

Chapter 3: Synthesis and characterization of poly (alkylene terephthalate)s containing cyclohexane ring.

This chapter describes the following

a) Synthesis of polyesters and copolyesters of dimethyl terephthalate, 1,4-butanediol and 1,4-bis(hydroxymethyl) cyclohexane.

b) Sequence analysis of the copolyesters and thermal properties.

c) Crystallization behavior and crystallization kinetics of the copolyesters.

Chapter 4: Synthesis and characterization of polyesters and copolyesters containing cyclopentane ring

This chapter describes the following

a) Synthesis of monomers, dimethyl-1,3-cyclopentane dicarboxylate and 1,3-bis(hydroxy methyl) cyclopentane.
b) Synthesis of homopolyester and copolyesters of dimethyl terephthalate, 1,4-butanediol and 1,3-bis(hydroxy methyl) cyclopentane.

c) Synthesis of polyester and copolyesters of dimethyl terephthalate, 1,4-butanediol and dimethyl-1,3-cyclopentane dicarboxylate.

d) Synthesis of polyester from 1,3-bis(hydroxy methyl) cyclopentane and dimethyl-1,3-cyclopentane dicarboxylate.

e) Sequence distribution analysis and thermal properties.

f) Crystallization behavior of the copolyesters.

Chapter 5: Synthesis and characterization of polyesters and copolyesters containing norbornane ring

This chapter describes the following

a) Synthesis of monomers, dimethyl bicyclo[2,2,1] heptane 2,3-dicarboxylate, 2,3-bis(hydroxymethyl)bicyclo[2,2,1] heptane and dimethyl-2,3-dimethyl bicyclo[2,2,1]heptane-2,3-dicarboxylate.

b) Synthesis of homopolyester and copolyesters of dimethyl terephthalate, 1,4-butanediol and dimethyl bicyclo[2,2,1] heptane 2,3-dicarboxylate

c) Synthesis of polyester and copolyesters of dimethyl terephthalate, 1,4-butanediol and 2,3-bis(hydroxymethyl)bicyclo[2,2,1] heptane

d) Synthesis of polyester and copolyesters of dimethyl terephthalate, 1,4-butanediol and dimethyl-2,3-dimethyl bicyclo[2,2,1]heptane-2,3-dicarboxylate.

e) Sequence distribution analysis and thermal properties

f) Crystallization behavior of copolyesters.

Chapter 6: Summary and conclusion

This chapter summarizes the results and conclusion of the work.

References


