

CHAPTER 54

TECHNOLOGY  
APPLIED CHEMISTRY & POLYMER  
TECHNOLOGY

Doctoral Theses

611. ANSHU DEV  
**Studies on the Agro Based Fatty Acids Epoxy Resins and their Composites.**  
Supervisor : Dr. A P Gupta  
Th 18022

*Abstract*

This research work has developed new epoxidized soybean oil (ESO) based polymers. Various characterization techniques used to the study of mechanical, thermo-mechanical, thermal and morphological properties of the different systems. The variation of DGEBA content is used to modify the epoxidized soybean oil (ESO) and the modified system shows the properties corresponding to the amount of modifier (DGEBA). From DMA, FTIR, mechanical properties, SEM and TGA results, it is concluded that properties are enhanced only up to 20phr DGEBA. At lower concentration of modifier, properties characteristic to ESO, which is soft and flexible with higher impact property, are obtained. At higher concentration of modifier, system obey property characteristic to DGEBA, which is inherently brittle.

*Contents*

1. Introduction. 2. Literature review. 3. Experimental and characterization. 4. Optimization of anhydride/epoxy ratio (R). 5. Modification of ESO by addition of a co-monomer. 6. Preparation of ESO based composites. 7. Summary and conclusions. References.

612. VIMAL KUMAR  
**Synthesis and Characterization of Lactic Acid Based Biodegradable Polymer and Composites.**  
Supervisor : Dr. A P Gupta  
Th 18043

*Abstract*

Present work evaluate the chain extended polymerization using methylene diphenyl diisocyanate as a chain coupler. A series of polymer samples is synthesized and characterized by thermal, spectroscopic and chromatographic studies. On the basis of results obtained CL-PLA 2 is optimized for the nanocomposites preparation. It is found that chain coupling is an attractive method for the synthesis of PLA with improved properties, over other conventional methods. Resulting polymer showed increase in the molecular weight and molecular weight distribution with improved storage modulus and glass transition temperature.

*Contents*

1. Introduction. 2. Review of literature. 3. Experimental and characterization. 4. Synthesis of chain-linked poly(Lactic Acid). 5. Preparation of CL-PLA/Nanocomposites. 6. Summary and conclusions. References.