

Public Abstract

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Title:Chemical Modifications to Produce Soy-Based Polyols

Petroleum-based oils have been used for all these years as the starting material for most of the commodity plastics and urethane products. Economic problems arise because petroleum is a finite resource and environmental issues have resulted because the decomposition of these materials in nature is lengthy and sometimes generates byproducts that are public hazard. The biopolymers offer the advantages of low cost, ready availability from renewable resources, and possible biodegradability.

This research work include the following chemical modifications for soybean oil to produce soy-polyol: polymerization of soybean oil, alcoholysis of polymerized soybean oil, epoxidation and oxirane-ring opening. The last chapter consists in the study of water-blown rigid and flexible polyurethane foam formulation. In this investigation, the soy-based polyol was used to substitute up to 100% the petroleum based polyol in the original foam formulation.