

Research Paper Introduction Example

The Synthesis of Flexible Polymer Blends from Polylactide and Rubber

Introduction

Polylactide (PLA) has received much attention in recent years due to its biodegradable properties, which offer important economic benefits. PLA is a polymer obtained from corn and is produced by the polymerization of lactide. It has many possible uses in the biomedical field and has also been investigated as a potential engineering material. However, it has been found to be too weak under impact to be used commercially.

One way to toughen polymers is to incorporate a layer of rubber particles and there has been extensive research regarding the rubber modification of PLA. For example, Penney et al. showed that PLA composites could be prepared using blending techniques and more recently, Hillier established the toughness of such composites. However, although the effect of the rubber particles on the mechanical properties of copolymer systems was demonstrated over two years ago, little attention has been paid to the selection of an appropriate rubber component.

The present paper presents a set of criteria for selecting such a component. On the basis of these criteria it then describes the preparation of a set of polymer blends using PLA and a hydrocarbon rubber (PI). This combination of two mechanistically distinct polymerizations formed a novel copolymer in which the incorporation of PI significantly increased flexibility.