

CHAPTER-11 ECO-FRIENDLY POLYMER MATRIX COMPOSITES FOR SUSTAINABLE DEVELOPMENT

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Abstract

The natural resources are renewable and never exhibit adverse effect to the man-kind, this made them potential choice to the petroleum resources. This natural resources marked its foot-print in material science area especially in polymer composites. The biodegradability of polymers and its composites is highly required to widen its application in various applications. In order to enhance the strength of the raw polymeric material various compounds have been introduced and their percentage of improvement is quantitatively measured by different thermal, mechanical and tribological tests. This chapter gives a overview on renewable polymers and its composites and their application in various sectors.

Keywords: Biodegradability; composites; polymers; mechanical strength; renewable.

11.1. Introduction

Biodegradable type of polymer composite materials has recently gained great attention in various disciplines (as shown in figure 1) due to its noticeable properties when compared to classical petrochemical-based plastic [1]. Those petrochemical-based resources are depleting continuously and this urges researchers to seek for alternate resources. Therefore, researchers have been continuously working on biodegradable type of materials which have advantages like biodegradability, comparable mechanical strength, reduced land filling and nevertheless renewable.

Eco-friendly materials can be any one of the following case:

- Micro-composite materials (contain micro-sized bio-filler and matrix),
- Nano-composites (contain nano-sized bio-filler and matrix), or
- Nano-papers.