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Vegetable Oil-Based Composites

Processing, Properties and Applications

Springer

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Preface

This book provides solid, quantitative descriptions and reliable guidelines, reflecting the maturation and demand of the field and the development of vegetable oil-based composites. This book focuses on the different vegetable oils used for the preparation of composites such as olive oil and canola oil. The coverage of the book highlighted the most exciting fillers used in the preparation of vegetable oil-based composites. This book will be of interest to researchers working in the fields of composite materials, material science, applied science, and bio-wastes. This book will be useful for scientists working on the preparation of composite materials from natural sources. This book will be very helpful for students in the development of green and sustainable composite materials, as well as graduates in material science, chemical engineering, and biocomposite materials.

The first introductory chapter "Introduction to Vegetable Oils" covers the basic information about vegetable oils and their application, and the second chapter "Vegetable Oil Based Polymer Composites—Processing Properties and Applications" provides information about the processing and applications of vegetable oil composites. Chapters "Olive Oil Based Composites" and "Canola Oil as a Bio-additive: Properties, Processing and Applications" covers the use of olive oil and canola oil for the preparation of various composites. Chapters "Vegetable Oil Based Polyurethane Composites" and "Vegetable Oil Based Epoxy Composites" describe the polyurethane and epoxy-based vegetable oil composites and their applications. Chapters "Fiber Reinforced Vegetable Oil Based Vinyl Polymer Composites" and "Natural Fiber Reinforced Vegetable Oil Composites" covers the use of various fibres in the processing of vegetable oil composites. The last two chapters "Vegetable Oil Based Nanoclay Composites" and "Carbon Nanotube and Graphene-Reinforced Vegetable Oil-Based Nanocomposites" describe about vegetable oil composites based on nano clay, carbon nanotubes and graphene-reinforced materials.

Finally, we assure the readers that the information provided in this book can serve as a very important tool for anyone working on vegetable oil composites. We are grateful to all the authors who contributed chapters to this book and who helped to

turn our thoughts into reality. Lastly, we are grateful to the Springer team for their continuous support at every stage to make it possible to publish on time.

Kota Samarahan, Malaysia — Showkat Ahmad Bhawani
Jeddah, Saudi Arabia — Anish Khan
George Town, Malaysia — Mohmad Nasir Mohmad Ibrahim
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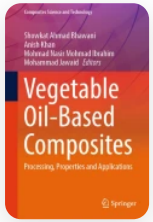

Vegetable Oil-Based Composites

Abul Hasnat, Abdul Moheman, Showkat Ahmad Bhawani & Khalid M. Alotaibi

Part of the book series: Composites Science and Technology ((CST))

Abstract

Attempts have been made to replace the non-renewable resources with renewable resources in the development of various significant materials for a wide range of applications. Vegetable oils are a reasonably abundant resource that is relatively inexpensive around the world. It also has several amenable functional groups that can be used as reaction sites. In this section, efforts have been made to present various types of vegetables and their physico-chemical parameters, as well as various reactive sites for derivatization to various useful polymers. Furthermore, the incorporation of nanoclay materials has been shown to significantly improve polymer performance when compared to pristine polymer of the same vegetable oil. Nanoclay modified epoxy, polyurethane, poly(ester-amide) and poly(ester) were also included in the text to demonstrate the importance of nanoclay polymers of vegetable origin.

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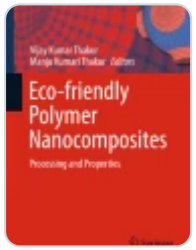

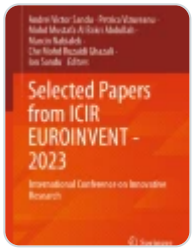

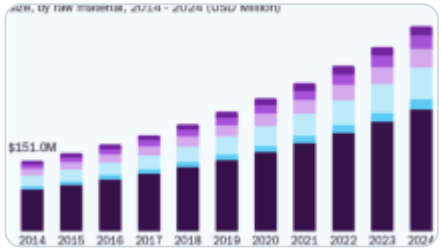

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