

# Bionanocomposites for Packaging Applications

Mohammad Jawaid · Sarat Kumar Swain  
Editors

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 Springer

*Editors*

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*Editors are honoured to dedicate  
this book to the*



*Mr. Ziaur Rahman  
(Father of Dr. Mohammad Jawaid)*



*Mr. Rabindra Nath Swain  
(Father of Prof. Sarat Kumar Swain)*

# Preface

This book introduces the current demand of eco-friendly bionanocomposite manufacturing and designing for packaging applications. The focus of this book is about the current demand of the bionanocomposite and their packaging applications. Bionanocomposite materials currently stand best packaging materials among the other materials such as conventional engineering composite materials, because of its outstanding features such as lightweight, low cost, environmentally friendly and sustainability. The specialism in bionanocomposites is inaugurated by its outstanding degradable and sustainable properties. Unlike other composites, this bionanocomposites are prepared with reinforcement of different nanomaterials including natural fibres and biodegradable resins. The unique feature of this book is that it presents a unified knowledge of this eco-friendly biocomposites on the basis of characterization, design, manufacture and applications.

This book assembles the information and knowledge on bionanocomposites and emphasizes the concept of gas barrier properties. This book benefits the lecturers, students, researchers and industrialist who are working in the field of packaging application in particular and material science in general. This book especially on bionanocomposites for packaging purpose is a valuable reference book, handbook and textbook for teaching, learning and research in both academic and industrial interests. This sustainable material for packaging applications penetrates into the market segment and has significant potential in automotive, marine, aerospace, construction, wind energy and consumer goods.

This book contains extensive examples and real-world products that will be suitable as per the need of markets. This book covers versatile topics such as perspectives of bionanocomposites, polymer-based bionanocomposites for future packaging materials, cellulose-reinforced biodegradable polymer composite film, nanohybrid active fillers in food contact biobased materials, oil palm biomass cellulose and polylactic acid/cellulose nanofibre composite, chitosan-based nanocomposite, natural biopolymer-based nanocomposite films, copper-reinforced cellulose nanocomposites, polysaccharides-based bionanocomposites, LDPE/RH/MAPE/MMT nanocomposite films, rubber-based nanocomposites and significance of

ionic liquids, proteins as agricultural polymers, and layered double hydroxide reinforced polymer bionanocomposites for packaging applications.

We are highly thankful to contributors of different chapters who provided us their valuable innovative ideas and knowledge in this edited book. We attempt to gather information related to bionanocomposites for packaging applications from diverse fields around the world (Turkey, Italy, Malaysia, India, USA, Pakistan, and Oman) and finally complete this venture in a fruitful way. We greatly appreciate contributor's commitment for their support to compile our ideas in reality.

We are highly thankful to Springer UK team for their generous cooperation at every stage of the book production.

Serdang, Malaysia  
Burla, India

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Sarat Kumar Swain

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