GREEN POLYMER COMPOSITES TECHNOLOGY

Properties and Applications

Edited by

Inamuddin

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Preface

In a broad sense, materials are said to be 'green' when they are biodegradable and renewable and of course environment friendly and fully sustainable in every respect. These are considered alternatives to the synthetic polymers. Synthetic polymers have posed great challenges to the environment and users due to issues such as degradation, incineration, global warming, their high cost of production, cross contamination during recycling and consumer toxicity risks. However, green polymer composites can be easily disposed of at the end of their service life without causing any harmful effects to the environment or users. Thus, the challenge of green composites requires the sourcing of 'green' polymers that can be used as matrices for the production of composites. Nowadays, green polymer composites are being developed using renewable polymers of natural origin such as starch, lignin, cellulose acetate, poly-lactic acid (PLA), polyhydroxylalkanoates (PHA) and polyhydroxylbutyrate (PHB).

Green polymer composites have in fact percolated every aspect of our daily life. The extensive use of green polymer composites in the manufacturing of basic utilities from carrier bags to engineered materials has revolutionized the human life style as well as the industrial scenario. The use of polymers and composites has deeply influenced the development of modern technological societies leading to a high standard of living.

Cutting-edge research is being carried out to develop and deploy environment-friendly polymer composites in critical areas of human endeavour such as basic utilities from carrier bags to prosthetic implants. Engineered materials using advanced green polymer composites are finding extensive use in sectors such as automotive, aerospace, agriculture, household goods, hygiene products, building and construction materials, paints and adhesives and biomedical and biomedicine.

This book is intended to compile and broadly explore the latest developments and applications of green polymer composites in the areas such as goods packaging and composting bags, green foams, anti-bacterial, anti-microbial and anti-fogging coatings for food stuff, adhesives, gums, wallpaper paste, resins, self-healing materials, tissue engineering scaffolds, pharmaceutical applications, drug delivery, bone tissue replacement and regeneration.

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Editor

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