

**EXPLORING
POLYMER
COMPOSITES** from
CHARACTERISATION
to **DESIGN**

EXPLORING POLYMER COMPOSITES from **CHARACTERISATION** to **DESIGN**

Editors

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PREFACE

The field of polymer composites has evolved significantly in recent decades. Becoming a cornerstone of modern engineering and materials science, polymer composites are one of the most promising materials for advanced applications. The versatility of polymers, combined with reinforcement from fibres or particles, enables the development of materials that exhibit superior mechanical, thermal, and electrical properties while remaining lightweight and cost-effective. These characteristics make polymer composites indispensable in industries demanding high performance and efficiency.

Exploring Polymer Composites from Characterisation to Design aims to provide a comprehensive exploration of the science, technology, and design principles that underpin the development of these advanced materials. It takes the reader on a journey through the innovative design methodologies employed to tailor the performance of polymer composites for specific applications and explores the various characterisation techniques used to understand their behaviour, structure, and properties. The book covers both the theoretical foundations and practical aspects, ensuring a balanced perspective that is both intellectually stimulating and applicable to real-world scenarios.

This book provides a critical discussion on the application of the concurrent engineering design principles approach in producing products based on composite material characteristics and delves into the intricacies of composite material behaviour, offering insights into how various types of fibres, including natural and synthetic fibres, processing conditions, and design factors interact to shape the final properties of these materials. This book is intended for researchers, engineers, and students who are either already working with polymer composites or

looking to enter the field. It serves as both a guide for those wishing to deepen their understanding of material characterisation and a source of inspiration for the next generation of product design based on polymer composite characteristics. This book is designed to enrich knowledge and broaden perspective on the exciting potential of polymer composites from design to characterisation.

In this new era of materials science, the importance of innovation in polymer composite design cannot be overstated. This book could serve as a valuable resource, offering both theoretical insights and practical knowledge that will help drive the next wave of advancements in this dynamic and transformative field.

Muhammad Asyraf Muhammad Rizal

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