

Preface

Nanoscience and nanotechnology offer numerous benefits in various areas, including human health, food processing, environmental safety, and device engineering. Nanofibers are materials in the diameter range of 3–100 nm and length range of 0.1–1000 μm . They are well known for their vast range of applications in sensors, catalysts, conductors, tissue engineering, and so on, owing to their high surface area-to-volume ratio, high porosity, and the ease of tuning their structures, functionalities, and properties. Knowledge of how atoms are united and how nanosized materials are made is essential to understanding nanoscience. In this book, researchers from all over the world highlight the importance of nanofibers in different aspects.

This book includes review and research articles related to the synthesis, characterization, and application of nanofibers. In Chapter 1, Dr. Sista reviews new perspectives of nanofiber synthesis and applications. In Chapter 2, Dr. Pal and Dr. Giri summarize the green synthesis of nanofibers. In Chapter 3, Dr. Yudoyono et al. discuss the electrospinning of carbon nanofibers using PVA polymer. In Chapter 4, Ph.D. Kizildag presents recent advances in applications of ceramic nanofibers. In Chapter 5, Dr. Hiremath et al. introduce antibacterial nanofibers produced by electrospinning. In Chapter 6, Prof. Kanu et al. demonstrate the fabrication of biofunctional curcumin/gelatin nanofibers and their healing process. In Chapter 7, Associate Prof. de Menezes et al. discuss electrochemical behaviour of cellulose nanofibrils functionalized with dicyanovinyl groups, and their use as electrocatalysts for carbon dioxide reduction. In Chapter 8, Prof. Dungani et al. review the production of nanocellulose using cellulase enzymes through Symbiotic Culture of Bacteria and Yeast (SCOBY). In Chapter 9, Prof. Stine and Dr. Sondhi discuss the progress in synthetic techniques over the last ten years to prepare porous gold films with emphasis on the technique of electrodeposition. In Chapter 10, Dr. Akande et al. report various methods of fabricating and manufacturing micro and nanosensors, membranes, and energy devices.

In Chapter 11, Prof. Jha addresses microwave-assisted synthesis of organic compounds and nanomaterials as a promising area of modern green chemistry. In Chapter 12, Prof. Chase et al. discuss polarization of electrospun polyvinylidene fluoride fiber mats and fiber yarns. In Chapter 13, Prof. Rout et al. summarize recent developments in the field of 2D material-based all-solid-state microsupercapacitors. In Chapter 14, Dr. Rodriguez et al. present research on pulsed electrochemical micromachining of stainless steel. In Chapter 15, Prof. Swaminathan examines the low-cost fabrication processes of radio frequency-micro electro mechanical systems switch and packaging. In Chapter 16, Dr. Khan et al. presents a comprehensive review of the latest advances of transparent electrodes for flexible and stretchable electronics. Finally, in Chapter 17, Dr. Navarro Santos et al. discuss calculation of the electronic properties and reactivity of nanoribbons and propose a conceptual density functional theory to calculate energetic, electronic, and reactivity of

one-dimensional nanomaterials such as carbon nanoribbons. This book is a useful resource for academics, professionals, scientists, and graduate and undergraduate students.

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