

**Book Review**  
**Nanofiber Membranes for Medical, Environmental,  
and Energy Applications 1st Edition**

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**ABSTRACT**

The book gathered latest discovery solutions from experts all over the globe who specialize in nanofiber membrane technology. The effort and knowledge sharing by the experts on the recent development of nanofiber membrane's fabrication, characterization, and performance for medical, environment and energy applications are greatly appreciated. This book provides readers with a holistic cycle of nanofiber membrane development, which comprehensively deliberates on how nanofibers incorporation affects the membrane formation, enhance the properties and performance of membranes and ultimately lead to different kinds of applications. There are thirteen chapters in the book, covering topics comprise of polymer, inorganic and composite-form of nanofiber membrane materials for a wide range of applications (e.g., liquid, gas and energy). Each chapter starts with a brief introduction on the particular topic, followed by the nanofiber membrane's production, characterization, performance and potential application of the nanofiber membranes. Challenges and future prospect are also well discussed in most of the chapters, providing rational perspective for the use of advanced nanofiber membranes in real world. The book comes with comprehensive discussion on nanofiber membranes form various applications such as medical (e.g. antimicrobial, biomedical, tissue engineering and regenerative medicine), water and wastewater treatment (e.g. membrane distillation, heavy metal, and toxic removal), and energy (e.g. fuel cell and ion exchange membranes). This could also give a clear picture on the trend of advanced materials as the way forward for the mentioned applications. Interestingly, this book shares a structured overview on recent achievements of nanofiber membranes in medical application, particularly on the electrospun as regenerative medicine for potential use in wound, vascular, nervous, bone, and dental applications. Besides that, it also discusses on fabrication of nanoscale fibrous scaffolds that mimic the natural extracellular matrix (ECM) of our body and enhance cell attachment, drug loading, and mass transfer that able to potentially improve care for millions of patients who suffered from inadequate medical treatments. This book also highlighted on the potential use of modified nanofiber membranes for wastewater treatments including superhydrophobic/superoleophilic nanofiber membranes and superhydrophilic/superoleophobic nanofiber membranes as type of superwetting materials. Detail discussion on conventional and latest development of membrane distillation for desalination and water treatment process, including fundamental concepts, operating principles and the future perspectives are also included in the book. There are three chapters in the book that discussed on the application of nanofiber membrane fabrication for energy generation. These include discussion on lithium-ion batteries, solar cells, dye-sensitized solar cells, supercapacitors, hydrogen storage and pressure-retarded osmosis, fabrication of nanocomposite

polymer electrolyte membrane for fuel cell applications and also nanofibers ion exchange membranes. One of the highlight of this book is a chapter on fabrication of advanced mesoporous nanofiber networks by phase separation-based methods, which employing flash-freezing nanocrystallization technique, and this technique is getting more attention in recent research literatures. Most importantly, this book does come along with intensive explanation on the working mechanism of separation and purification of the nanofiber membranes. Overall, this book is well written, and it serves as a platform for knowledge sharing, and I extremely recommend this book to students, academicians, researchers and industrial players. It is suggested that in future edition, every chapter in this book will be substantially enhanced and updated to reflect the latest developments in the fields. Besides that, wide range of research scopes pertaining nanofiber membrane fabrication for medical, environmental, and energy applications is also recommended to be further highlighted and reviewed.