

Preface

The field of renewable energy generation and storage sectors has seen an upsurge in research and development activities and has made significant and rapid strides in device development. We have foreseen a renewed interest in this emerging field (specifically the field of porous based materials) by both the student population and scientists and engineers. This book originated from Dr. Balakrishnan and Dr. Rajagopalan's sustained research and substantial research background in the area of porous energy materials and their application to energy generation and storage devices. This book intends to cater to a broad base of seniors and graduate students having varied backgrounds such as physics, electrical and computer engineering, chemistry, mechanical engineering, materials science, nanotechnology and even to a reasonably well-educated layman interested in porous based materials for variety applications. Given the present unavailability of a "mature" textbook having suitable breadth of coverage (although basic books and plethora of journal articles are available with the added difficulty of referring to multiple sources), we have carefully designed the book layout and contents with contributions from well-established experts in their respective fields. This book is aimed at, graduate and postgraduate students/researchers in the aforementioned disciplines.

The book consists of 13 well-rounded chapters arranged in a logical and distilled fashion. Each chapter is intended to provide an overview with examples chosen primarily for their educational purpose. The readers are encouraged to expand on the topics discussed in the book by reading the exhaustive references provided towards the end of each chapter. The chapters have also been written in a manner that fits the background of different science and engineering fields. Therefore, the subjects have been given a primarily qualitative structure and in some cases providing detailed quantitative analysis. Based on our own experience, the complete set of topics contained in this book can be covered in a single semester and prepare the student for a research program in the advancing field of porous materials, apart from equipping the student for mastering the subject.

In order to augment the research topics and help the reader grasp the fundamental nuances of the subject each chapter caters several simple, well-illustrated equations and schematic diagrams. The progression of chapters is designed in such a way that the basic theory and techniques are introduced early on, leading to the evolution of the field of porous materials in the areas of energy storage and generation. The readers will find this logical evolution highly appealing as it introduces a didactic element to the reading of the textbook apart from grasping the essentials of an important subject. Wherever possible, color versions of the figures are incorporated, and they can also be made accessible through online prints.

We, the editors (Avinash Balakrishnan and Ranjusha Rajagopalan) express our thanks to the dedicated scientists who have written the individual chapters. Their enthusiasm in writing the chapters of high quality and delivering on time after incorporating the review comments, made the release of the textbook a simplified task for us. We would also like to thank the editorial team (CRC Press) for encouraging us to begin this project and guiding it to its completion. Thanks for their excellent attention to detail and for their constant review of the project progress. In addition, we express our thanks to our colleague Ms. Shaymaa Al-Rubaye, and Professors from Institute superconducting and electronics materials (ISEM), University of Wollongong (UOW) (Distinguished Professor Hua Kun Liu and Director Professor Shi Xue Dou). Our sincere thanks, to Suzlon Energy Limited team

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