

OLED Displays and Lighting

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Wiley-IEEE Press, 2016

232 pages, \$90.00 (e-book \$72.99)

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This book provides an elaborate description and presentation of the recent technological evolution of organic light-emitting diodes (OLEDs), starting from basic research to product development. Specific emphasis is given toward OLED application for displays and lighting. The book starts with the history of OLEDs from 1987 to 2015, and ends with information on new technologies involved in OLED fabrication.

The first three chapters briefly introduce the history of OLEDs (chapter 1), the fundamentals (chapter 2), and light emission mechanisms (chapter 3) that are necessary to understand the underlying “basic physics of OLEDs.” A systematic and in-depth presentation is made in the remaining eight chapters, giving specific details on materials, devices, fabrication, displays, lighting, and new technologies of flexible as well as quantum dot OLEDs. These make the book suitable

for varied scientific communities (e.g., readers with a basic physics background, those working in interdisciplinary areas of research-technology, and those involved in technology development).

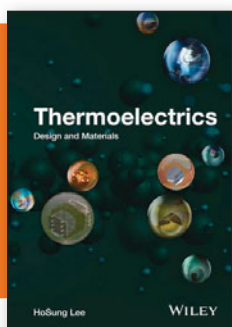
Chapters 4–7 are requisites of the field to understand and to undertake research work on applications of OLEDs. Accordingly, in-depth material aspects are clearly explained in chapter 4, whereas various types of OLED devices and their fabrication processes are explained in chapters 5 and 6, respectively. Chapter 7 includes information on performance-related parameters of OLEDs necessary to compare and grade them for commercial applications. This set of chapters prepares one to be well versed in OLED technology to an extent that can help a researcher in initiating research in this ever-growing area.

Chapters 8 and 9 describe the state of the art of OLED technology in the context

of display and light applications. Aspects of OLED fabrication in the flexible configuration are included in chapter 10. This chapter especially indicates the promising future of flexible displays and light sources in the era to come. Present evolution and future aspects of OLED devices (e.g., electrodes, thin-film transistors, wet processability, and quantum dot utilization) are included in the final chapter.

The book clearly explains and demonstrates the evolutionary role of OLEDs with respect to their simple fabrication technology. It shows how an era of gas or fluorescent material lighting would come to an end by virtue of OLED technology development. The references included are up to date. The logical and systematic selection and progression of chapters is helpful. Each chapter is self-sufficient. Figures and tables are included at desirable points in the book and are highly informative. This book will be equally useful for research student scientists as well as technologists. The book does not contain any exercises, which may make it unsuitable as a course book, but good as a reference book.

Reviewer: Pramod H. Borse, International Advanced Research Centre for Powder Metallurgy and New Materials, India.



Thermoelectrics: Design and Materials

HoSung Lee

Wiley, 2016

440 pages, \$135.00 (e-book \$108.99)

ISBN 978-1-118-84895-1

The text of this book is divided into two parts, with the first part comprising eight chapters that cover basic thermodynamic concepts and definitions, design of thermoelectric power-generation devices, and specific applications. The first chapter begins with a brief historical introduction to thermoelectrics, followed by an overview of thermoelectric phenomena.

The next three chapters delve specifically into thermoelectric devices, with chapters on power generation, refrigeration, and optimization of design of thermoelectric devices, including heat dissipation. This is followed by an in-depth investigation of specific formalism of the thermodynamics with exact and numerical solutions to heat flow through a device. Thermal and

electrical contact issues and modeling of thermoelectric devices are then covered. Finally, specific applications of thermoelectric power generation and refrigeration are provided. The content is nicely developed, considering the large amount of material presented. The author provides appropriate references for the material covered and for further exploration of the subject matter. References include up-to-date work as well as original work and the main reference books for the field.

The second part covers the last eight chapters, where the author develops the physics required to understand basic transport phenomena in materials, which is invaluable in understanding fundamental transport in thermoelectric materials. As is typically done in solid-state physics