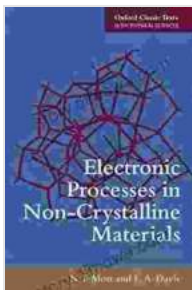


Electronic Processes In Non Crystalline Materials: Oxford Classic Texts In The Physical Sciences

The world of materials is vast and diverse, encompassing a wide spectrum of properties and applications. Among this myriad of materials, non-crystalline materials hold a unique and intriguing position, characterized by their lack of long-range order in their atomic structure. This structural disorder gives rise to a fascinating array of electronic properties that set them apart from their crystalline counterparts.



Electronic Processes in Non-Crystalline Materials (Oxford Classic Texts in the Physical Sciences)

by Marco Wilkinson

★★★★☆ 4.8 out of 5

Language : English

File size : 34108 KB

Lending : Enabled

Screen Reader: Supported

Print length : 608 pages



In "Electronic Processes in Non-Crystalline Materials," a seminal work published in 1982 and now reissued as part of the esteemed Oxford Classic Texts in the Physical Sciences series, Dr. N. F. Mott and Dr. E. A. Davis provide a comprehensive and authoritative exploration of this captivating field.

Delving into the Book

The book is meticulously structured into three distinct parts, each delving deeper into the intricacies of electronic processes in non-crystalline materials.

Part I: The Nature of Non-Crystalline Materials

In Part I, the authors lay the groundwork for understanding the unique properties of non-crystalline materials. They begin by introducing the concept of disordered materials and its profound impact on the electronic structure of these materials. They then delve into the various types of non-crystalline materials, ranging from amorphous semiconductors and organic electronics to disordered metals and liquids.

Part II: The Electronic States of Non-Crystalline Materials

Part II focuses on the electronic states within non-crystalline materials. The authors explore the density of states, localization, and transport properties in these materials. They discuss the role of defects and impurities in influencing electronic behavior and provide insights into the fundamental mechanisms underlying charge transport and carrier recombination.

Part III: The Applications of Non-Crystalline Materials

In Part III, the authors turn their attention to the practical applications of non-crystalline materials. They cover a wide range of applications, including solar cells, light-emitting diodes (LEDs), thin-film transistors, and sensors. They provide a comprehensive overview of the challenges and opportunities in each application area, highlighting the immense potential of these materials for future technological advancements.

Exploring Key Concepts and Applications

Throughout the book, Mott and Davis delve into a wealth of key concepts and applications that underscore the importance of electronic processes in non-crystalline materials.

Amorphous Semiconductors

Amorphous semiconductors, with their unique electronic properties, have emerged as promising materials for a wide range of electronic devices. The authors discuss the fundamental principles governing the electronic behavior of these materials, including their density of states, mobility, and photoconductivity.

Organic Electronics

Organic electronics, based on organic materials with semiconducting properties, have garnered significant attention due to their potential for flexible and low-cost electronic devices. The book explores the electronic properties of organic materials, their charge transport mechanisms, and their applications in organic solar cells and transistors.

Disordered Metals and Liquids

Disordered metals and liquids, despite their lack of long-range order, exhibit complex electronic properties that are crucial for understanding various physical phenomena. The authors investigate the localization and transport properties of these materials, shedding light on their behavior in different environments.

Energy Storage and Sensors

Non-crystalline materials play a vital role in energy storage devices, such as batteries and supercapacitors. The authors explore the electronic processes underlying charge storage and release in these materials. Additionally, they discuss the applications of non-crystalline materials in sensors, highlighting their unique capabilities in detecting various physical and chemical parameters.

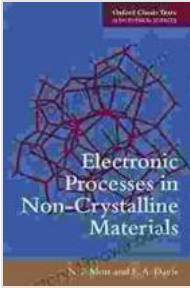
Legacy and Impact

"Electronic Processes in Non-Crystalline Materials" has left an enduring legacy in the field of materials science. It remains an indispensable reference for researchers, students, and practitioners working in the area of non-crystalline materials.

The book's comprehensive coverage, rigorous analysis, and insightful discussions have shaped our understanding of the electronic properties of non-crystalline materials and paved the way for numerous technological advancements.

For anyone seeking a comprehensive and authoritative guide to the fascinating world of electronic processes in non-crystalline materials, "Electronic Processes in Non-Crystalline Materials" is an essential read. With its in-depth exploration of key concepts, applications, and historical context, this Oxford Classic Text continues to inspire and inform generations of scientists and engineers.

As the field of non-crystalline materials continues to evolve, "Electronic Processes in Non-Crystalline Materials" will undoubtedly remain a cornerstone for understanding the electronic properties and applications of these remarkable materials.



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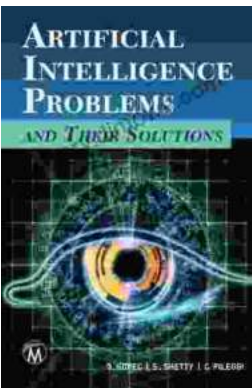
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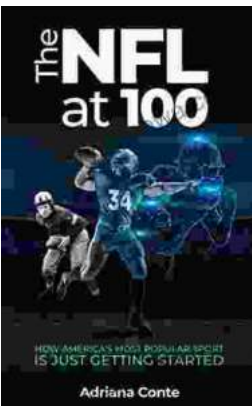
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Demystifying AI's Challenges and Embracing its Promise: A Comprehensive Guide to Artificial Intelligence Problems and Their Solutions

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