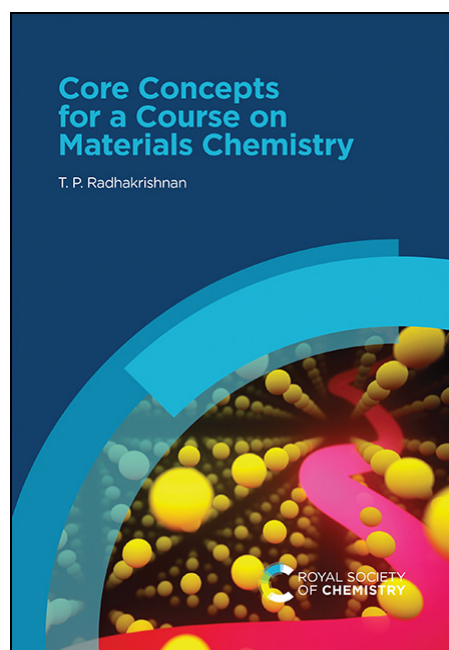


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Core Concepts for a Course on Materials Chemistry

T P Radhakrishnan University of Hyderabad, India

Synopsis

Anyone who has taught materials chemistry will be aware that it is an expansive topic. Whilst this makes it exciting, it can also overwhelm students who end up lost in the detail. This book provides the antidote. Aimed at advanced undergraduate and graduate students, **Core Concepts for a Course on Materials Chemistry** is a distillation of the fundamental topics born out of the author's 30 years of teaching the subject.

Brief Contents

- Solid State Structure
- Defects and Non-stoichiometry
- Thermal Properties
- Electrical Properties
- Magnetic Properties
- Optical Properties
- Synthesis and Fabrication
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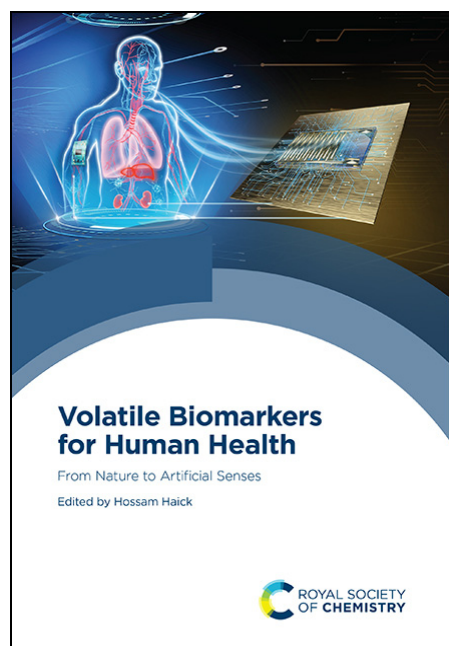
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Volatile Biomarkers for Human Health From Nature to Artificial Senses

Hossam Haick Technion-Israel Institute of Technology, Israel

Synopsis

Most books on volatile biomarkers focus on breath analysis, but this book extends to all body fluids. Coverage includes chemical volatile communication biomarkers in humans, new materials and smart sensing solutions. It introduces the concept of volatile biomarkers within the body both in terms of basic and translational sciences.

Brief Contents

- The Origin and Emission of Volatile Biomarkers in Breath
- Origin and Emission of Volatile Biomarkers in Breath
- Blood VOC Biomarkers
- Origin and Emission of Volatile Biomarkers from Faeces
- Origin and Emission of Volatile Biomarkers from Urine
- Saliva and Related Specimens as a Source of VOC Biomarkers
- Origin and Emission of Volatile Biomarkers in Skin
- Origin and Emission of Volatile Biomarkers from Genital Fluid
- Signal Transfer and Transduction between Cells
- VOCs as Mediators of Immunological Signalling
- Volatile Signatures of the Microbiome
- Interplay Between Volatile Biomarkers and Body Fluids
- Hybrid Volatolomics in Healthcare
- Engineering Volatile Biomarkers for Disease Detection
- Sampling: The First and Most Important Step
- Analytical Approaches for Disease Detection
- Monitoring Drug Pharmacokinetics
- Selective Sensors for Volatile Biomarkers
- Cross-reactive Sensors (or e-Noses)
- Nanomaterial-based Sensors for Volatile Biomarkers
- Wearable Sensors for Detection of Human Health
- Adaptive and Biocompatible Technologies
- Data Analysis
- Machine Learning and Artificial Intelligence
- Volatile Biomarkers in Clinical Decision Support Systems

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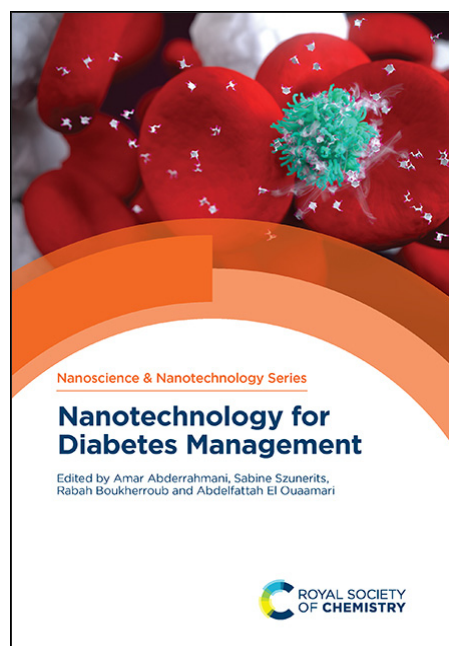
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Nanotechnology for Diabetes Management

Amar Abderrahmani University of Lille, France
Sabine Szunerits University of Lille, France
Rabah Boukherroub University of Lille, France
Abdelfattah El Ouamari Robert Wood Johnson Medical School, USA

Synopsis

The aim of this book is to present the latest developments of nanomedicine for the treatment of different facets of diabetes and related disorders. With a multi-disciplinary approach, chapter focus on previously overlooked topics in glucose sensing, insulin delivery and secretion, bioimaging and transplantation of islets. This book is suitable for researchers in nanomedicine, nanotechnology and diabetes research looking into the emergence of new research approaches for the treatment of this life-threatening disease.

Brief Contents

- Chemical Approaches for Beta-cell Biology
- Epigenomics of Type 2 Diabetes
- Optimizing the Current Type 2 Diabetes Antidiabetics with Nanotechnologies: Where Do We Stand?
- Amyloidosis Inhibition and Detection of Human Islet Amyloid Polypeptide with Nanomaterials
- Phytochemicals in the Management of Diabetes
- Inhalation of Insulin for Diabetes Management
- Microfluidic and Organ-on-chip Based Technologies for Diabetes Therapy and Research
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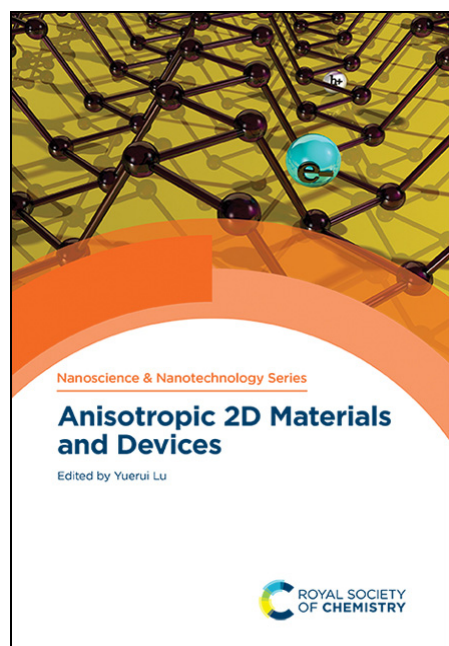
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Anisotropic 2D Materials and Devices

Yuerui Lu Australian National University, Australia

Synopsis

Presenting recent progress in exploring anisotropic 2D materials, the reader will be introduced to phosphorene and its arsenic alloys, monochalcogenides of group IV elements in the form of MX (M = Ge, Sn and X = S, Se, Te), low-symmetry transition-metal dichalcogenide (TMD) materials such as rhenium disulphide (ReS_2) and rhenium diselenide (ReSe_2), and organic 2D materials. Covering many aspects of anisotropic 2D materials, including recent research progress, major obstacles, and future direction, this book will be a useful reference for materials scientists, chemists, physicists and engineers. This book may also be of use to those in chemical academia and industry more broadly.

Brief Contents

- Introduction
- Defect Engineering in Layered Black Phosphorus for Multi-functional Optoelectronics
- Anisotropic Polaritons in Layered Two Dimensional (2D) Materials
- Highly Enhanced Many-body Interactions in Anisotropic 2D Semiconductors
- Organic Anisotropic 2D Materials for Next-generation Optoelectronics
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