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With contributions from international authors and editors that cover all of chemistry and related fields, our books programme is relevant globally and provides support to scientists, researchers, students and teachers. We are excited about what we have to share with you this year.

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In 2020, you can look forward to more titles that cover emerging areas like biomaterials science and inorganic materials, and more additions to our new *Food Chemistry, Function and Analysis* series. The core disciplines are represented by works focusing on significant developments in analytical science, green chemistry, catalysis and detection science.

Continuing our collaboration with IUPAC, we will also be publishing the fourth edition of the *Compendium of Terminology in Analytical Science*, an abridged version of *Quantities. Units and Symbols in Physical Chemistry*, and the *Glossary of Terms Used in Molecular Toxicology*.

Books to enlighten

We are here to help everyone in the chemical sciences to do their best work and drive scientific progress. 2020 textbook topics include *Microfluidics and Lab-on-a-Chip, Controlled Drug Analysis* and *Conservation Science.*

In *Good Chemistry*, we provide a textbook that goes beyond experimental procedure, to help practising scientists develop the skills to recognise the ethical and social dimensions of their own work and act appropriately.

Books to inspire

Chemistry is at the centre of everything you can see, smell, touch and taste, so we will be adding to the books that show the chemistry in our lives. *Sticking Together, Discovering Cosmetic Science* and *Perfume in the Bible* are just a few examples of books to broaden your chemistry horizons that you can to look forward to in 2020.

If you have any queries, contact **books@rsc.org** to talk to the team.

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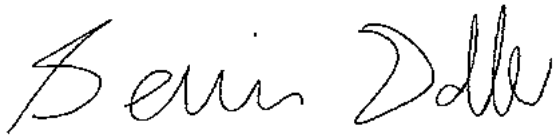

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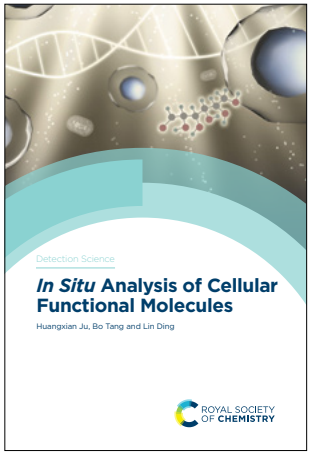

About the series

ISSN: 2052-3068

Providing a comprehensive look at the state of the art in detection technologies and materials used in the development of diagnostics for clinical, medicinal, and environmental applications, the books in this Series are a valuable reference for graduate students and professional researchers across academia and industry. Emphasising the detection of chemicals and biochemical species in a quantitative fashion, the Series will also interest advisors, consultants and government agency staff, who will benefit from the detailed nature of these titles.

Analytical Electrogenerated Chemiluminescence

From Fundamentals to Bioassays

Neso Sojic Université de Bordeaux, France

Highlighting the various fields in analytical chemistry where electrogenerated chemiluminescence (ECL) is widely applied, this book details some well-established ECL sensing applications like immunoassays, DNA and enzymatic assays and those emerging recently like multiplexed ECL or the combination of ECL and bipolar electrochemistry and their use in diagnostic issues. It presents the processes, theory, bioanalytical applications and the recent developments involved in the instrumentation and analytical nano/micro-systems. Being at the frontier between several scientific disciplines involving analytical chemistry, electrochemistry, photochemistry, materials sciences, nanochemistry and biology, it has broad appeal.

Hardback | 492 pages | 9781788014144 | 2020 | £179.00 | $250.00

ISBN 978-1-78801-414-4

Analytical Strategies for Cultural Heritage Materials and their Degradation

Juan Manuel Madariaga University of the Basque Country, Spain

Reviewing the analytical strategies used in the study of cultural heritage assets ie movable - artworks and archaeological items - and immovable – eg mural paintings, archaeological sites, historical buildings, this book pays particular attention to the analytical methodology (spectroscopic and chromatographic analysis) and ensuring reliable results are obtained. It considers the influence of the environment on the conservation state and how modern analytical methods have improved the possibilities of analysing materials. The book emphasizes multi-method approaches on a range of materials, an approach that is of keen interest to those working in conservation practice. It is for final year undergraduate study and masters' level and supplementary reading for postgraduates and academics who require analytical techniques to enhance their research.

Hardback | 300 pages | 9781788015240 | 2021 | £159.00 | $220.00

ISBN 978-1-78801-524-0

Challenges in Detection Approaches for Forensic Science

Lynn Dennany University of Strathclyde, UK

This book will explore the specific challenges encountered by forensic scientists and the developments that are being made to address the requirement of law enforcement agencies within the framework of the legislative requirements. Currently there are many forensic science books, which focus on the underlying theory of chemical approaches, but there is a clear gap in the dissemination of the current state of the art approaches for forensic science. This gap includes current detection strategies and how legislation and changes to forensic practices has prompted these changes as well as how research in the field is seeking to address the current hurdles in a cohesive manner. For graduates and forensic professionals, it will also cover essential principles for students and illustrate how these relate to applications.

Hardback | 350 pages | 9781839160226 | 2021 | £169.00 | $235.00

ISBN 978-1-83916-022-6

Confining Electrochemistry to Nanopores

From Fundamentals to Applications

Yi-Lun Ying East China University of Science and Technology, China | **Yao Lin** East China University of Science and Technology, China | **Yi-Tao Long** East China University of Science and Technology, China

Aimed at developing the concept of the electrochemical confined space in analysing single molecules, this book serves as a stepping stone to many exciting discoveries in nanopore-based analysis of biological processes and chemical reactions in confined space. There has been no newly published books on nanopore technology that provide a general overview of the research on nanopore-based sensing but the field of nanopore sensors is growing rapidly. The book provides a good source of nanopore studies for researchers interested in and working in the general areas of electrochemistry and nanobiotechnology, especially on nanopore sensors.

Hardback | 250 pages | 9781788012713 | 2020 | £159.00 | $220.00

ISBN 978-1-78801-271-3

Detection Methods in Precision Medicine

Mengsu (Michael) Yang City University of Hong Kong, Hong Kong | **Michael Thompson** University of Toronto, Canada

Precision Medicine is a medical model that proposes the customization of healthcare, with medical decisions, treatments, practices, or products being tailored to the individual patient. It has a particularly important role in the treatment of inherited diseases and cancer as physicians often screen for genetic markers in their patients, yet it is increasingly clear that clinicians are only tapping the surface of what it can offer. Developing new diagnostic tests and expanding the use of biomarkers enables the identification of the molecular cause of disease, and ultimately supports the development of novel, more precisely targeted treatments. This book will support the literature in the area from the bioanalytical point of view. The scientific and medical community are interested in this area with detection methods covering topics for physicians, medical laboratory technologists and scientists/engineers.

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ISBN 978-1-78801-761-9

In Situ Analysis of Cellular Functional Molecules

Huangxian Ju Nanjing University, China | **Bo Tang** Shandong Normal University, China | **Lin Ding** Nanjing University, China

In situ analysis of cellular functional molecules has attracted considerable interest as it can provide spatially or temporally resolved information of these essential molecules on/within living cells through non-invasive methods. This book introduces the tailor-made design of detection probes as well as schemes from a top-down perspective according to the unique characteristics of cellular functional molecules. Written by leaders in the field, it will provide a comprehensive overview to those working on different aspects of cellular analysis and cell biology.

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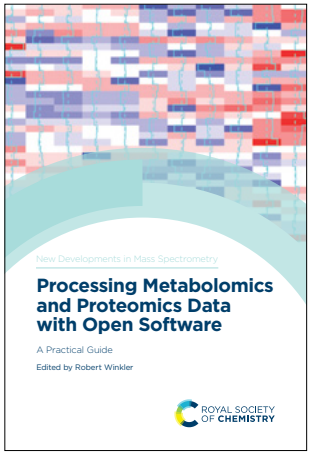

About the series

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Examining instrument and method development and new applications of mass spectrometry, this Series is an important resource for graduate students, researchers and analytical chemists interested in the respective instrumentation and techniques. The books present the key facts and concepts in a concise and readable manner to keep readers up-to-date with the latest information and to promote the practice of mass spectrometry techniques.

Advanced Fragmentation Methods in Biomolecular Mass Spectrometry

Probing Primary and Higher-order Structure with Electrons, Photons and Surfaces

Frederik Lermyte University of Warwick, UK

Breaking down large biomolecules into fragments in a controlled manner is key to modern biomolecular mass spectrometry. This book is a high-level introduction – as well as a reference work for experienced users – to ECD, ETD, EDD, NETD, UVPD, SID, and other advanced fragmentation methods. It provides a comprehensive overview of their history, mechanisms, instrumentation, and key applications. No dedicated book exists at this time that provides a comprehensive overview. While contributing authors have included recent research, the primary aim of this book is to fill this gap and act as an authoritative guide. Aimed at postgraduate and professional researchers (mainly in academia, but also in industry), it could be used as supplementary reading for advance students on mass spectrometry or analytical (bio)chemistry courses.

Hardback | 350 pages | 9781839161049 | 2021 | £169.00 | $235.00

ISBN 978-1-83916-104-9

Lipidomics

Current and Emerging Techniques

William Griffiths Swansea University, UK | **Yuqin Wang** Swansea University, UK

Lipidomics is one of the newest 'omics' techniques with growing importance in bioscience. This book discusses interesting standard and non-standard techniques relevant to the measurement and analysis of lipids by mass spectrometry. It provides a guide to the possibilities of the techniques and introduces the reader to exciting newer methods which allow isomer differentiation, improve sensitivity, allow spatial location and go beyond annotation of simply matching a mass to a database entry. For the first time in a book, the emerging methods and advantages and disadvantages of new technologies for lipid structure characterization are highlighted.

Hardback | 350 pages | 9781788011600 | 2020 | £169.00 | $235.00

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Processing Metabolomics and Proteomics Data with Open Software

A Practical Guide

Robert Winkler CINVESTAV Unidad Irapuato, Mexico

Metabolomics and proteomics allow deep insights into the chemistry and physiological processes of biological systems. These omics methods rely heavily on mass spectrometry, however, building valid models from raw mass spectrometry data is challenging, and the field of data analysis and integration is evolving rapidly. This book will enable researchers, practitioners and students from different backgrounds to analyze metabolomics and proteomics mass spectrometry data. The book contains tutorials, code examples and datasets that facilitate the training and the development of the reader's own programs and workflows.

Hardback | 400 pages | 9781788017213 | 2020 | £179.00 | $250.00

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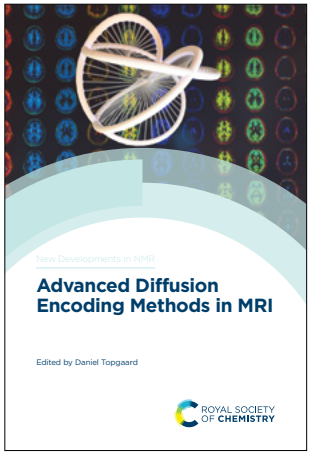

About the series

ISSN: 2044-253X

Focusing on novel aspects of method and instrumentation development, applications in emerging fields and new techniques and technologies, this Series documents the important advances being made in this field. The books provide comprehensive introductions to the relevant theory to facilitate greater understanding and to encourage wider usage of NMR techniques, making them ideal for students, researchers and practising analytical scientists, as well as manufacturers with an interest in the instrumentation.

Advanced Diffusion Encoding Methods in MRI

Daniel Topgaard Lund University, Sweden

The medical MRI community is by far the largest user of diffusion NMR techniques and this book captures the current surge of methods and provides a primary source to aid adoption in this field. Recently published papers indicate great potential for improved diagnosis of the numerous pathological conditions associated with changes of tissue microstructure that are invisible to conventional diffusion MRI. This book disseminates these recent developments to the wider community of MRI researchers and clinicians. The chapters cover the theoretical basis, hardware and pulse sequences, data analysis and validation, and recent applications aimed at promoting further growth in the field.

Hardback | 500 pages | 9781788017268 | 2020 | £179.00 | $250.00

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In-cell NMR Spectroscopy

From Molecular Sciences to Cell Biology

Yutaka Ito Tokyo Metropolitan University, Japan | **Volker Dötsch** University of Frankfurt, Germany | **Masahiro Shirakawa** Kyoto University, Japan

In-cell NMR spectroscopy is a relatively new field. Despite its short history, recent in-cell NMR-related publications in major journals indicate that this method is receiving significant general attention. No informative books specifically focused on in-cell NMR have been published yet. This book provides detailed descriptions covering the background of in-cell NMR, methods for in-cell biological techniques and NMR spectroscopy, as well as applications, and future perspectives. Researchers in biochemistry, biophysics, molecular biology, cell biology, structural biology as well as NMR analysts interested in biological applications will all find this book valuable reading.

Hardback | 322 pages | 9781788012171 | 2020 | £159.00 | $220.00

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Long-lived Nuclear Spin Order

Theory and Applications

Giuseppe Pileio University of Southampton, UK

In 2004, the idea that a long-lived form of spin order, namely singlet order, can be prepared from nuclear spin magnetisation emerged. This first book on the subject gives a thorough description of the various aspects that intervene in the development of the topic and details the interdisciplinary applications. The book starts with a section dedicated to the basic theories of long-lived spin order and then proceeds with a description of the state-of-the-art experimental techniques developed to manipulate singlet order. The book proceeds by describing several applications of this order in various fields of research and then concludes by covering the generalization of the concept of singlet order by introducing and discussing other forms of long-lived spin order. This idea has caught the attention of research groups interested in exploiting this form of order in different fields of research spanning from biology to materials science and from hyperpolarisation to quantum computing.

Hardback | 300 pages | 9781788015684 | 2020 | £159.00 | $220.00

ISBN 978-1-78801-568-4

Magnetic Resonance and its Applications in Drug Formulation and Delivery

Michael D Mantle University of Cambridge, UK | **Leslie P Hughes** AstraZeneca, UK

This book details the latest research and development in the use of magnetic resonance imaging and spectroscopy as tools to give quantitative insights/information concerning late stage pharmaceutical formulation, tablet manufacturing and drug dissolution behaviour. The book combines different facets of magnetic resonance and highlights the use of spatial resolution (MRI) and how this adds to the knowledge base to further our understanding of the microscopic physicochemical processes occurring during drug release from solid dosage forms. Focusing on late stage development rather than molecular drug discovery provides a unique approach and the book will appeal to a diversity of disciplines using spectroscopy for study.

Hardback | 400 pages | 9781788017404 | 2021 | £179.00 | $250.00

ISBN 978-1-78801-740-4

NMR and MRI of Electrochemical Energy Storage Materials and Devices

Yong Yang Xiamen University, China | **Riqiang Fu** Florida State University, USA | **Hua Huo** Harbin Institute of Technology, China

This book introduces NMR and MRI methods for investigating electrochemical storage materials and devices including the theory of paramagnetic interactions and relevant calculation methods, a number of specific NMR approaches developed for battery materials and case studies of a variety of related materials. Energy storage material is a hot topic and NMR has emerged as a powerful tool to enable an understanding of the working/failing mechanisms of these materials and devices. Due to the complexity of the topic, the book will be written for academics – postgraduate and above - and industrial readers requiring an overview of new methodologies being developed in the electrochemical arena. Each chapter includes some basic level information aimed at readers less familiar with the topics including undergraduates.

Hardback | 350 pages | 9781788018487 | 2021 | £169.00 | $235.00

ISBN 978-1-78801-848-7

Electrochemistry

Volume 16

Craig Banks Manchester Metropolitan University, UK | **Steven McIntosh** Lehigh University, USA

Providing the reader with an up to date digest of the most important research currently carried out in the field, Electrochemistry Volume 16 is compiled and written by leading experts from across the globe. This volume is a key reference for researchers providing a timely overview of this exciting and developing area.

Hardback | 250 pages | 9781788016926 | 2020 | £314.95 | $440.00

ISBN 978-1-78801-692-6

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Nuclear Magnetic Resonance

Volume 46

Paul Hodgkinson Durham University, UK

Nuclear magnetic resonance has proved a uniquely versatile and powerful spectroscopic technique, with applications across chemistry, physics and medicine. The success of NMR and its constant redevelopment means that the literature is vast and wide-ranging. Each chapter in this volume is a distillation of the key recent literature in different areas covering the spectrum of NMR theory and practice, and including solution-state, solid-state and in-vivo NMR. These reports will be invaluable both for new researchers wishing to engage with literature for the first time, and for seasoned practitioners, particularly service managers, wishing to keep in touch with the ever-expanding ways in which NMR is used.

Hardback | 300 pages | 9781782629986 | 2021 | £314.95 | $440.00

ISBN 978-1-78262-998-6

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Advances in Portable X-ray Fluorescence Spectrometry

Instrumentation, Application and Interpretation

B Lee Drake University of New Mexico, USA

This book provides a comprehensive assessment of the state of the art in nondestructive and destructive XRF analysis. With authors from both academia and industry, the coverage is wide ranging including details on applications and how specific analysis are done. The general introductory chapters are very important for informing worldwide users of this technology and how powerful it is. Chapters on mapping and core analysis will go beyond the species of XRF and venture into analytics. Aimed at graduates and postgraduates using this instrumentation who require accessible background information in order to develop quality analysis. It will go beyond appealing to traditional uses (art conservation and archaeology) of this technique to new fields where adoption is moving quickly.

Hardback | 380 pages | 9781788014229 | 2021 | £169.00 | $235.00

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Compendium of Terminology in Analytical Chemistry

4th Edition

D Brynn Hibbert University of New South Wales, Australia

How do you describe an analytical method, or name the new chemical that you have just assayed, or report the units of the measurement? For analytical chemists, the principal tool of the trade, or source of terms, is this book - the so-called Orange Book. Originating in 1978, this latest edition takes into account the expansion of new analytical procedures and at the same time the diversity of the techniques and the quality and performance characteristics of the procedures. This new volume will be an indispensable reference resource for the coming decade, revising and updating additional accepted terminology. New chapters on chemometrics and statistics, immuno- and bio-analytical methods of analysis and sampling and sample preparation have been added

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