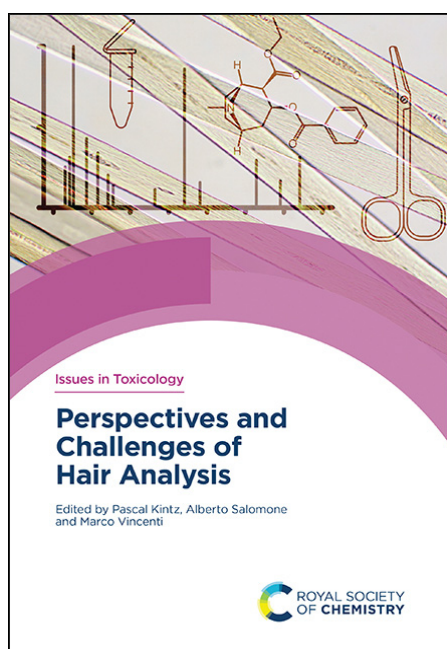


# Advance Book Information



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**Series:** Issues in Toxicology  
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**THEMA:** JKVFI, MKGT, PNF  
**BISAC:** SCIO13000, SCIO56000

## Perspectives and Challenges of Hair Analysis

Pascal Kintz X-Pertise Consulting, France  
Alberto Salomone University of Turin, Italy  
Marco Vincenti University of Turin, Italy

### Synopsis

Hair analysis is a reliable and widely used tool to evaluate drug exposure in many fields including workplace testing, drug abuse history and withdrawal control, post-mortem toxicology, doping control, therapeutic drug monitoring of pharmaceuticals and even environmental exposure to toxic agents. The improvement of analytical procedures and instrumental technologies, together with the continuous introduction of new psychoactive substances have led to an increasing number of studies and practical applications of hair analysis. This book is a comprehensive guide to hair analysis from general concepts, ideal for students and those new to the field, to interpretation and advanced methods for experts working in the area. With contributions from world-leading scientists in each field, this book describes state-of-the-art, emerging issues and recent analytical approaches to hair analysis which will serve as an essential tool to clinical and forensic toxicology laboratories across the globe.

### Brief Contents

- Anatomy and Biology of Hair at Different Ages
- Interpretation: Incorporation of Xenobiotics into Hair
- Effects of External Contamination and Cosmetic Treatments on Hair Testing Can Be Explained... Most of the Time!
- Insight into Drug Extraction from the Keratin Matrix
- Recent Trends in Forensic and Clinical Applications of Hair Analysis
- Multi-analyte Methods and High-resolution Mass Spectrometry for Hair Analysis
- Markers of Alcohol Use
- Hair Analysis to Understand the Diffusion of New Psychoactive Substances
- Hair Analysis and Doping Control
- Hair Versus Nail: Is There a Place for Other Keratin Matrices?
- Hair Analysis in Asia
- Metals in Hair
- Controversies in Hair Analysis... or 30 Years of Challenges and Issues

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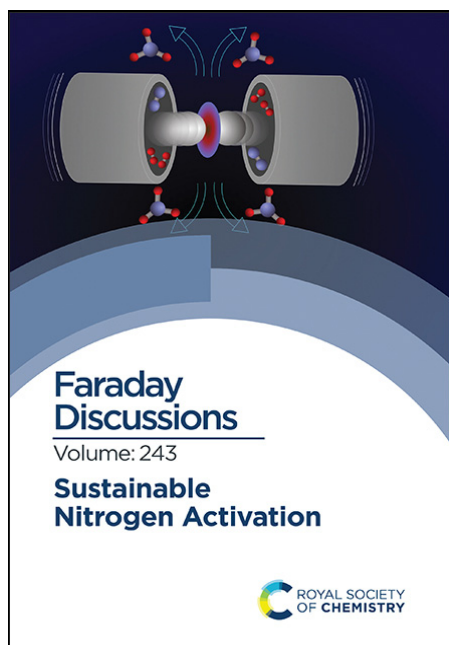
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# Advance Book Information



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**Series:** Faraday Discussions  
**ISSN:** 1359-6640  
**Publisher:** Royal Society of Chemistry  
**ISBN:** 978-1-83767-090-1  
**Price:** £170.00 | \$235.00  
**Publishing date:** 23/08/2023  
**Target Audience:** Professional and scholarly  
**Format:** Hardback  
**Size:** 234 x 156 (Royal 8vo) mm  
**Pages:** 400  
**BIC:** PNRD, RNU, TDCB  
**THEMA:** PNRD, RNU, TDC  
**BISAC:** SCIO13050, SCIO13060

## Sustainable Nitrogen Activation Faraday Discussion 243

### Synopsis

Industrial scale ammonia synthesis, as accomplished by the Haber-Bosch process, was a landmark achievement of the 20th century. However, as currently practiced, including feedstock generation, the process accounts for 1-2% of global energy demand and contributes significant fossil-fuel-based CO<sub>2</sub> emissions. Accordingly, there is much contemporary interest in the development of more sustainable ammonia synthesis routes which could, for example, be operated on the local scale employing renewable energy.

### Brief Contents

- Heterogeneous catalytic and chemical looping routes to N<sub>2</sub> activation
- Electrocatalytic and photocatalytic routes to N<sub>2</sub> activation
- Enzymatic N<sub>2</sub> activation
- Homogeneous N<sub>2</sub> activation
- Alternative routes to NH<sub>3</sub> and its applications

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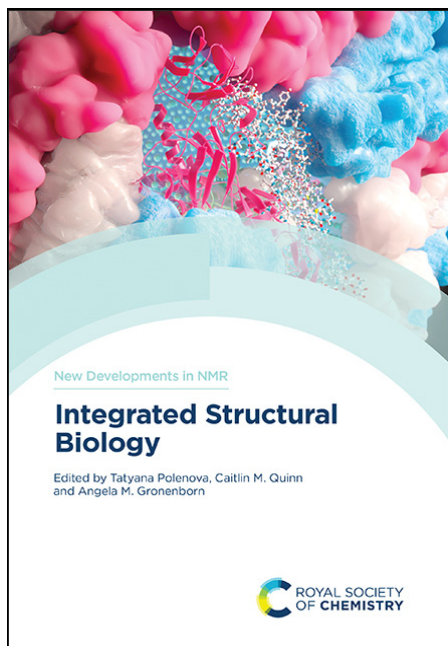
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## Integrated Structural Biology

Tatyana Polenova University of Delaware, USA

Caitlin M Quinn University of Delaware, USA

Angela M Gronenborn University of Pittsburgh, USA

### Synopsis

Providing an overview of the contemporary integrated biology approaches for solving structures and understanding mechanisms of complex biological systems, this book includes methodology chapters and discusses how these methods are used in synergy to address challenges in the field. Filling a gap in the literature, it discusses both the techniques and the applications to the latest major areas of research. The book is targeted to both the current practitioners of structural biology and scientists who are interested in entering the field.

### Brief Contents

- Decoding Atomic Addresses: Solution NMR Resonance Assignment of Proteins
- Solid-state NMR Spectroscopy and Dynamic Nuclear Polarization
- Electron Paramagnetic Resonance in Structural Biology
- Cryo-electron Microscopy and Tomography: Going for Atomic Resolution in Macromolecular Assemblies and Entire Cells
- In-cell Structural Biology Through the Integration of Solution NMR Spectroscopy and Computational Science
- Solid-state NMR Based Integrative Structural Methods for Protein and Viral Assemblies
- Time-resolved Crystallography on Protein Photoreceptors and Enzymes
- Integrative Structural Biology of Enzyme Active Sites
- Mechanistic Studies of Membrane Proteins Using Integrated Solid-state NMR and Computational Approaches
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- Unsupervised Refinement of Protein Structures
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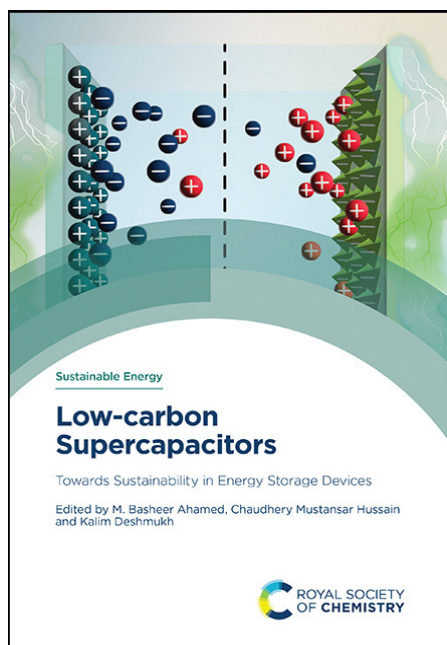
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**THEMA:** RNU, TGMM, THY  
**BISAC:** SCIO13080, SCIO24000, TEC021020, TEC031020

## Low-carbon Supercapacitors Towards Sustainability in Energy Storage Devices

**M Basheer Ahamed** BSA Crescent Institute of Science and Technology, India  
**Chaudhery Mustansar Hussain** New Jersey Institute of Technology, USA  
**Kalim Deshmukh** University of West Bohemia, Czech Republic

### Synopsis

In recent years, there has been increasing research into more sustainable electrode materials for supercapacitor applications. This is an ideal book for researchers and industry professionals at the energy-environment nexus, searching for new advancements in supercapacitor science and technologies.

### Brief Contents

- Fundamentals, Design, Challenges and Future Prospects
- New Prospectives
- Synthesis Techniques for Green Supercapacitors
- Fabrication Techniques of Green Supercapacitors
- New Materials for Low Carbon Supercapacitors
- Biopolymer-based Green Supercapacitors
- Nanocomposite Based Green Supercapacitor
- Advances in Low Carbon Supercapacitors Based on Nanocomposite
- Bioactive and Biodegradable Supercapacitors
- Biomass-derived Highly Porous Carbons for High-rate Supercapacitors
- Nature-inspired Green Supercapacitors: Advantages and Limitations
- Adapting Green Supercapacitors in Portable and Wearable Electronics
- Applications of Green Supercapacitors in Transportation Systems
- AI and ML Tools for Green Supercapacitors
- Emerging Applications of Green Supercapacitors
- Low-carbon Supercapacitors for Emerging Applications
- Sustainability of Green Nanocomposites-based Supercapacitors
- Safety Regulations, Environmental and Health Impact

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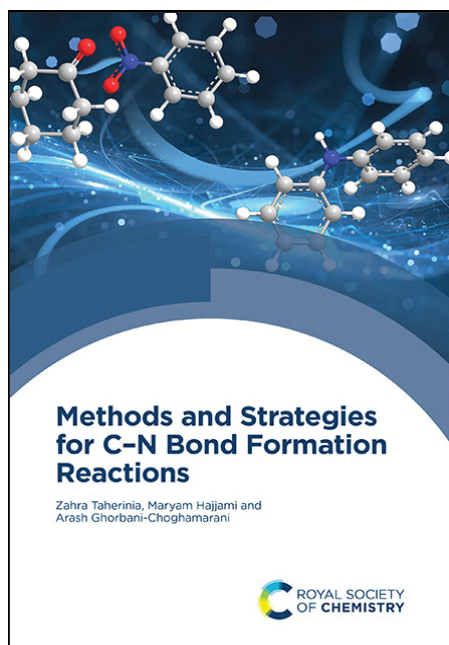
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**BIC:** PNN, PSBZ, PSD

**THEMA:** PNN, PSD, PSE

**BISAC:** SCIO07000, SCIO13040, SCIO49000

## Methods and Strategies for C-N Bond Formation Reactions

Zahra Taherinia Ilam University, Iran

Maryam Hajjami Bu-Ali Sina University, Iran

Arash Ghorbani-Choghamarani Bu-Ali Sina University, Iran

### Synopsis

Organic compounds containing amino groups are one of the most important classes of chemicals in both academia and industry. This class of materials is important in organic synthesis due to its widespread applications in natural products, agrochemicals, pharmaceuticals, and advanced materials. This book is a concise overview of modern approaches to N-alkylation and N-arylation of primary, secondary and tertiary amines using alkylating and arylating reagents with amino sources found in both basic and applied chemical research. It is an ideal reference for advanced and postgraduate students as well as academic and industrial chemists working in organic, natural product, catalytic, medicinal, and polymer chemistry.

### Brief Contents

- Historical Background of the Synthetic Methods and Properties of Amines
- Synthetic Methods for Alkyl Amines
- Synthetic Methods for Primary Anilines
- Synthetic Methods for Diarylamines and Triarylamines
- Synthesis of Amines from a Sustainable Perspective in Deep Eutectic Solvents, and Application of Amines in Different Areas

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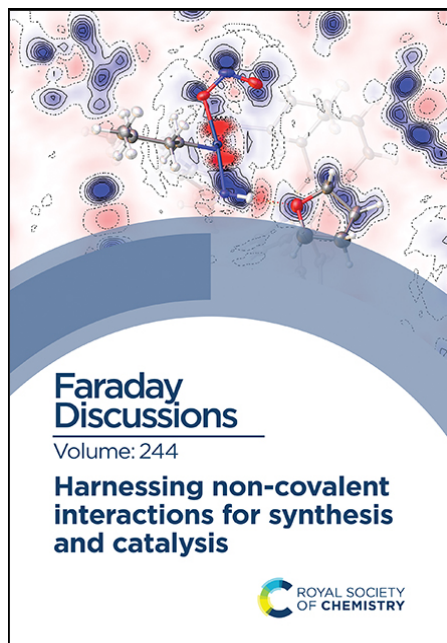
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**Series:** Faraday Discussions  
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**Pages:** 400  
**BIC:** PNN, PNRD, UYM  
**THEMA:** PNRA, PNRD, PNRR  
**BISAC:** SC1013040, SC1013050

## Harnessing Non-covalent Interactions for Synthesis and Catalysis Faraday Discussion 244

### Synopsis

The areas of synthesis and catalysis are largely driven by non-covalent interactions, and it is therefore essential to understand, control, and manipulate them. Doing so would allow for the optimisation of the properties and functions of new catalysts across the length scales. The current challenges involved in this area include structure determination of reactive intermediates, ascertaining structure-activity relationships, modelling transient states in catalytic cycles, and developing processes for reliable synthesis of non-covalent systems. This volume brings together internationally leading researchers in the fields of synthesis, materials, and catalysis, particularly involving systems where non-covalent interactions are a crucial factor.

### Brief Contents

- The importance of non-covalent interactions in synthesis
- Understanding the structural and electronic changes within these catalytic systems
- Modelling and computational analysis of reactive sites
- Controlling the activity and selectivity of a synthetic catalyst by manipulation of the surroundings

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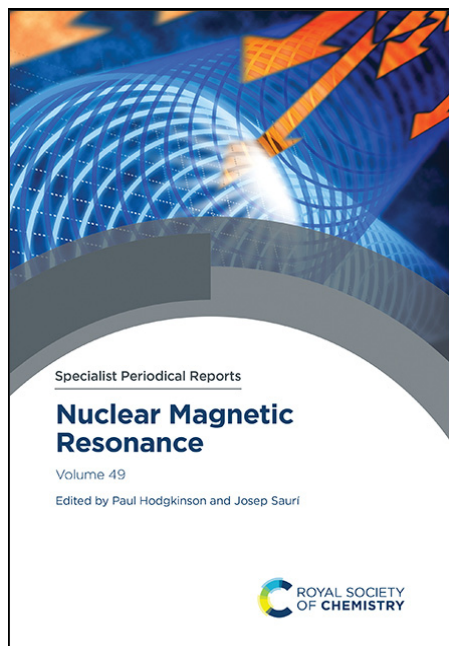
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# Advance Book Information



## Nuclear Magnetic Resonance Volume 49

Paul Hodgkinson Durham University, UK  
Josep Sauri Universitat Autònoma de Barcelona, Spain

### Synopsis

With applications across chemistry, physics and medicine, nuclear magnetic resonance is a proven, uniquely versatile and powerful spectroscopic technique. 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 theory and computation of nuclear shielding, NMR of soft matter, hyperpolarisation techniques and NMR of living systems. These reports are invaluable both for new researchers wishing to engage with literature for the first time, and for seasoned practitioners, particularly service managers, needing to keep in touch with the ever-expanding ways in which NMR is used.

### Brief Contents

- Theory and computation of nuclear shielding
- Theoretical and practical aspects of indirect spin-spin couplings
- Nuclear spin relaxation
- Advances in NMR spectroscopy of small molecules in solution
- Solid-state NMR spectroscopy
- Hyperpolarisation techniques
- NMR of soft matter systems
- NMR of proteins and nucleic acids
- NMR in living systems

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**Series:** Specialist Periodical Reports  
**ISSN:** 0305-9804  
**Publisher:** Royal Society of Chemistry  
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**Price:** £314.95 | \$440.00  
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**Pages:** 260  
**BIC:** PNFS  
**THEMA:** PNFR  
**BISAC:** SCIO13010, SCIO78000

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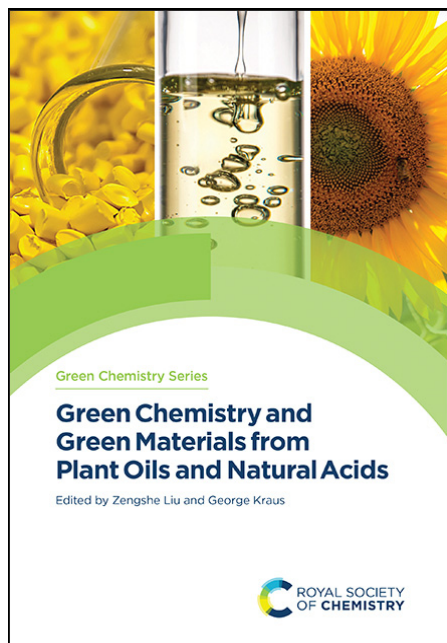
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# Advance Book Information



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**Publisher:** Royal Society of Chemistry

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**Target Audience:** Professional and scholarly

**Format:** Hardback

**Size:** 234 x 156 (Royal 8vo) mm

**Pages:** 262

**BIC:** PNN, PSB, RNU, TCB, TGB

**THEMA:** PNN, PSB, RNU, TGML

**BISAC:** SC1007000, SC1013040, TEC021000

## Green Chemistry and Green Materials from Plant Oils and Natural Acids

**Zengshe Liu** NCAUR, ARS/USDA, USA  
**George Kraus** Iowa State University, USA

### Synopsis

There is an increasing awareness that materials and chemicals produced from fossil fuels are not sustainable, both in terms of the pollution caused by the extraction and production processes and the fact that there is only a finite supply of these fossil fuels. Plants are a source of a wide variety of chemicals many with interesting properties and these chemical feedstocks are considered renewable rather than finite. This book covers the application of these natural materials into polymers, lubricants and plasticizers.

### Brief Contents

- Strategic Approach to the Design of Polymers from Natural Oils
- Natural Epoxy Oil (Euphorbia Oil) Polymerization in Liquid Carbon Dioxide-Green Solvent
- Soybean Oil-based Polymers and Their Composites
- Plant Oil-based Polyurethanes
- Non-isocyanate Polyurethane from Vegetable and Microalgal Oil
- Preparation and Application of Renewable Intrinsically Flame-retardant Epoxy Resins from Plant Oils
- Reactions of Mixed Natural Acids and Esters in Acidic Media
- Industrial Chemicals *via* Decarboxylation of Natural Carboxylic Acids
- A Novel Application of Chemically Modified Eleostearic Acid Methyl Ester (FAME) for Improving Diesel Lubricity
- Sustainable Lubricant Formulations from Natural Oils: A Short Review
- Plant Oil-based Plasticizers
- Genetic and Process Engineering for Select Glycolipid Biosynthesis from Plant/Algal Oils or Their Derivatives

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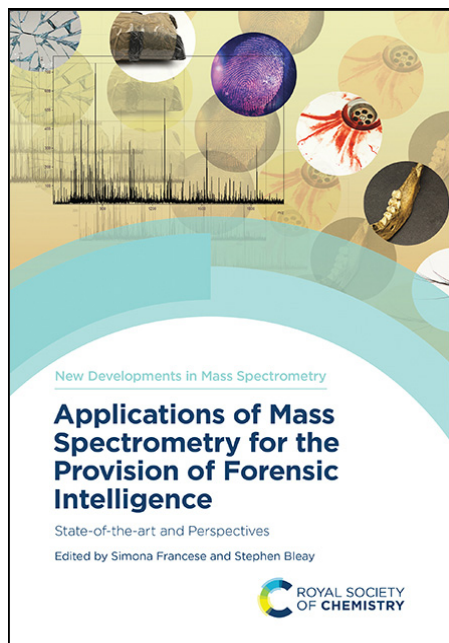
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**Series:** New Developments in Mass Spectrometry  
**ISSN:** 2045-7545

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**ISBN:** 978-1-83916-811-6

**Price:** £159.00 | \$220.00

**Publishing date:** 20/12/2023

**Target Audience:** Professional and scholarly

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**Size:** 234 x 156 (Royal 8vo) mm

**Pages:** 300

**BIC:** JKVF1, PNFS

**THEMA:** JKVF1, PNFS

**BISAC:** LAW041000, SCI013010

## Applications of Mass Spectrometry for the Provision of Forensic Intelligence State-of-the-art and Perspectives

Simona Francese Sheffield Hallam University, UK  
Stephen Bleay London South Bank University, UK

### Synopsis

Mass spectrometry is one of the most versatile analytical techniques due to the vast range of analytes that it can detect and quantify and, as such, the legal/forensics community has certainly benefited from its use, which has enabled provision of reliable evidence in court cases. This book provides up-to date knowledge to professionals using mass spectrometry-based tools within the forensic practice.

### Brief Contents

- The Application of Mass Spectrometry to Explosive Casework
- The Application of Isotope Ratio Mass Spectrometry to Forensic Casework
- ICP MS and IRMS for Elemental and Isotopic Forensic Investigations
- Mass Spectrometry Methods for Securing Road Traffic Drugs and Casework Toxicology Convictions
- Gas Chromatography Mass Spectrometry Based Approaches for the Analysis of Seized Drugs
- AccuTOF-DART for Rapid Presumptive Screening of Drugs of Abuse
- Use of Matrix Assisted Laser Desorption Ionisation Mass Spectrometry for the Analysis of Fingerprint and Blood Evidence
- Use of Secondary Ion Mass Spectrometry for the Analysis of Forensic Evidence
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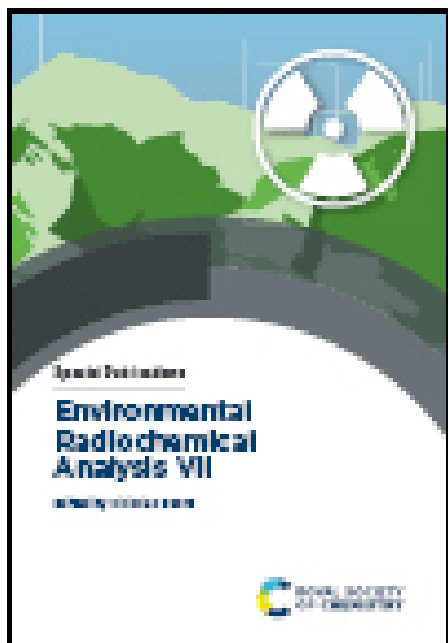
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**Series:** Special Publications  
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**Publisher:** Royal Society of Chemistry  
**ISBN:** 978-1-83767-063-5  
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**Target Audience:** Professional and scholarly  
**Format:** Hardback  
**Size:** 234 x 156 (Royal 8vo) mm  
**Pages:** 182  
**BIC:** PNF, PNRL, RNF  
**THEMA:** PNC, PNF, PNRL, TQD  
**BISAC:** SCI013010, SCI013080, SCI058000

## Environmental Radiochemical Analysis VII

Nicholas Evans Nottingham Trent University, UK

### Synopsis

This book is a snapshot of the work of leading scientists from across the globe on environmental radiochemistry and radioecology, nuclear forensics and radiation detection, radioanalytical techniques and nuclear industry applications. The research contributions were first presented at the 14th International Symposium on Nuclear and Environmental Radiochemical Analysis in September 2022.

### Brief Contents

- Localisation, isolation and leaching of single hot particles from various environmental matrices in the vicinity of the Chernobyl power plant
- Transuranium elements produced by the Castle Bravo explosion
- Coincidence and anti-coincidence gamma ray spectroscopy in radionuclide identification
- Application of plutonium radiochronometry to understand material processing impacts for nuclear forensics
- Application of radiocaesium microscale observation methodology to parmelioid lichen and ultrastructural analyses using STEM-EDS
- Improving UK access to radionuclides for molecular radiotherapy
- Determination of Blue Carbon sequestration rates in the UK North Sea using lead-210 and complementary fingerprinting tools
- A molecular dynamics study of helium clustering in high temperature plutonium dioxide
- Fast Am, Pm and Sr separation after automated fusion of highly dense barite concrete
- Development of microfluidic systems for actinide separation using functionalised methacrylate monoliths
- Research reactor support for nuclear forensics studies and the development of a companion graduate course
- Distribution of  $^{210}\text{Po}$  and  $^{210}\text{Pb}$  activity and physico chemical effects of undisturbed alluvial clay soil in Belagavi district, Karnataka, India
- Analysis of the sorption of Tc(IV) to some clay minerals
- Precise measurement of trace actinides using Phoenix TIMS
- The role of c-type cytochromes and extracellular flavins in the bioreduction of uranyl(VI) by *Shewanella oneidensis*

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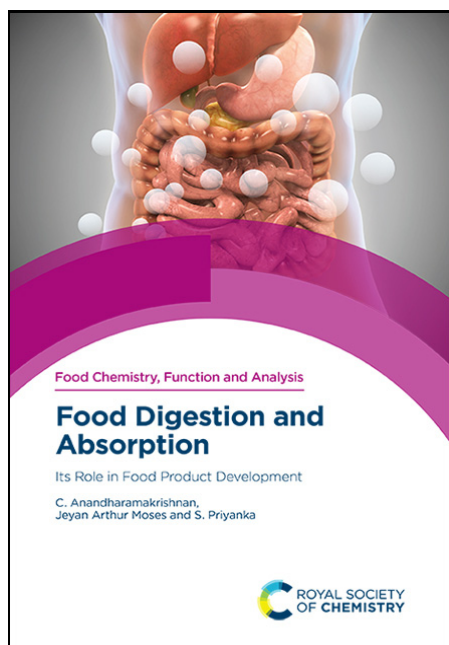
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## Food Digestion and Absorption Its Role in Food Product Development

**C Anandharamakrishnan** CSIR-National Institute for Interdisciplinary Science and Technology, India  
**Jeyan Arthur Moses** National Institute of Food Technology, Entrepreneurship and Management, India  
**S Priyanka** Indian Institute of Food Processing Technology, India

### Synopsis

Focussing on the complexity of the food digestion process from oral cavity to intestine, this book looks at the anatomical intricacies of the digestive system, techniques currently used to study food digestibility, the glycaemic index and bioavailability of food components. It also provides a detailed understanding of various modification techniques, critical information for any food product development, such as modification of food structure, its composition, and size. This highly interdisciplinary book will be useful not only readers in the field of medicine, but those involved in food science, nutrition and food physics.

### Brief Contents

- Human Oral Cavity and Oral Processing of Foods
- Human Stomach and Gastric Digestion
- Small Intestine, Digestion and Nutrient Absorption
- Large Intestine and Gut-Brain-Microbiota Interactions
- Simulating Food Digestion and Absorption
- Food Structure and the Complexity of Food Matrices
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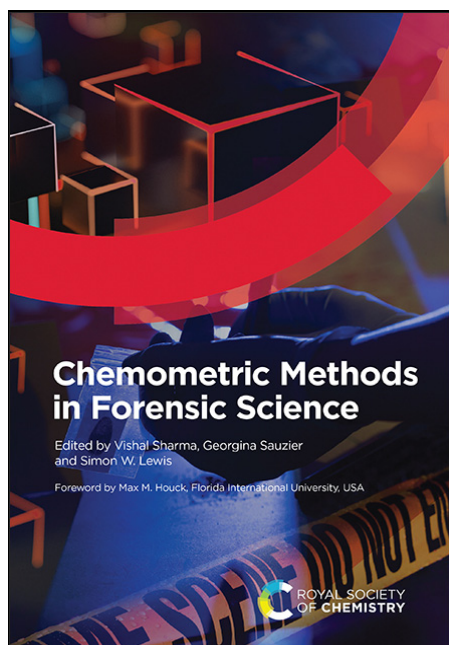
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**THEMA:** JKVF1, PNF  
**BISAC:** LAW041000, SCI013010

## Chemometric Methods in Forensic Science

Vishal Sharma Panjab University, India  
Georgina Sauzier Curtin University, Australia  
Simon W. Lewis Curtin University, Australia

### Synopsis

Chemometrics can provide informative and statistically validated analyses within a forensic context and there has been an increase in the use of chemometrics to characterise forensic exhibits. Introducing chemometric methods suitable for forensic practitioners, this book fills a gap in the literature outlining how such methods could be applied to forensic casework, what limitations to these approaches exist and future trends emerging in the field. It presents a detailed discussion of chemometric methods used for the examination of forensic exhibits including their advantages, limitations and efficiency. The book is written at a level suitable for MSc forensic science courses.

### Brief Contents

- Introduction
- Chemometric Methods
- Illicit Drugs and Pharmaceuticals Analysis
- Fire and Explosions Investigation
- Food Forensics
- Cosmetics and Personal Products
- Trace Evidence
- Questioned Document Examination
- Forensic Analysis of Bodily Fluids by Vibrational Spectroscopy in Combination with Chemometrics
- Environmental Forensics
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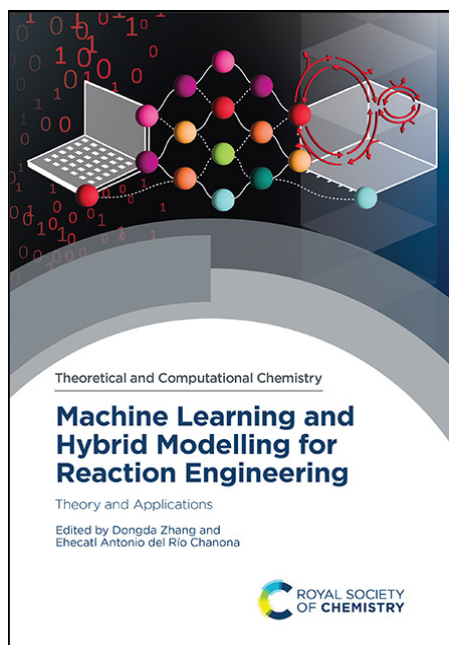
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## Machine Learning and Hybrid Modelling for Reaction Engineering Theory and Applications

Dongda Zhang University of Manchester, UK  
Ehecatl Antonio del Río Chanona Imperial College London, UK

### Synopsis

Over the past decade, there has been a significant shift from traditional mechanistic and empirical modelling into statistical and data-driven modelling for applications in reaction engineering. Summarising the latest research and innovation of hybrid modelling for chemical/biochemical reaction engineering, this book fills a gap in the methodology development of hybrid models.

### Brief Contents

- Physical Model Construction
- Data-driven Model Construction
- Hybrid Model Construction
- Model Structure Identification
- Model Uncertainty Analysis
- Interpretable Machine Learning for Kinetic Rate Model Discovery
- Graph Neural Networks for the Prediction of Molecular Structure-Property Relationships
- Reaction Network Simulation and Model Reduction
- Hybrid Modelling Under Uncertainty: Effects of Model Greyness, Data Quality and Data Quantity
- A Data-efficient Transfer Learning Approach for New Reaction System Predictive Modelling
- Constructing Time-varying and History-dependent Kinetic Models via Reinforcement Learning
- Surrogate and Multiscale Modelling for (Bio)reactor Scale-up and Visualisation
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