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**Chemistry**  
**434 Fall**  
**2016**  
**Advanced**  
**Analytical**  
**Chemistry**

*This book is a  
hands-on guide  
for the organic*

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*chemist. Focusing on the most reliable and useful reactions, the chapter authors provide the information necessary for a chemist to strategically plan a synthesis, as well as repeat the*

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*procedures in the  
laboratory.*

*Consolidates all  
the key*

*advances/concept  
s in one book,  
covering the most  
important  
reactions in  
organic  
chemistry,  
including*

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*substitutions,  
additions,  
eliminations,  
rearrangements,  
oxidations,  
reductions*

*Highlights the  
most important  
reactions,  
addressing basic  
principles, advant  
ages/disadvantage*

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434, Fall 2016

*s of the  
methodology,  
mechanism, and  
techniques for  
achieving  
laboratory  
success Features  
new content on  
recent advances  
in CH activation,  
photoredox and  
electrochemistry,*

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*continuous  
chemistry, and  
application of  
biocatalysis in  
synthesis*

*Revamps chapters  
to include new  
and additional  
examples of  
chemistry that  
have been  
demonstrated at a*

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*practical scale  
Problem solving is  
central to the  
teaching and  
learning of  
chemistry at  
secondary,  
tertiary and post-  
tertiary levels of  
education,  
opening to  
students and*

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*professional  
chemists alike a  
whole new world  
for analysing  
data, looking for  
patterns and  
making  
deductions. As an  
important higher-  
order thinking  
skill, problem  
solving also*



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*constitutes a  
major research  
field in science  
education.*

*Relevant  
education  
research is an  
ongoing process,  
with recent  
developments  
occurring not only  
in the area of qua*

*ntitative/computat  
ional problems,  
but also in  
qualitative  
problem solving.  
The following  
situations are  
considered, some  
general, others  
with a focus on  
specific areas of  
chemistry:*

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*quantitative  
problems,  
qualitative  
reasoning,  
metacognition  
and resource  
activation,  
deconstructing  
the problem-  
solving process,  
an overview of the  
working memory*

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*hypothesis,  
reasoning with  
the electron-  
pushing  
formalism,  
scaffolding  
organic synthesis  
skills,  
spectroscopy for  
structural  
characterization  
in organic*

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*chemistry,  
enzyme kinetics,  
problem solving in  
the academic  
chemistry  
laboratory,  
chemistry  
problem-solving in  
context, team-  
based/active  
learning,  
technology for*

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*molecular  
representations,  
IR spectra  
simulation, and  
computational  
quantum  
chemistry tools.  
The book  
concludes with  
methodological  
and  
epistemological*

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*issues in problem  
solving research  
and other*

*perspectives in  
problem solving in  
chemistry.*

*Progress in  
Medicinal  
Chemistry,  
Volume 59,  
provides a review  
of eclectic*

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*developments in medicinal G139 chemistry. Each chapter is written by an international board of authors, with this release focusing on Small Molecules - Giant Leaps for Immuno-*

*Oncology,*



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*Reviewing P2X7,  
Reviewing ASK1,  
and Reviewing  
DNA-encoded  
libraries.*

*This book  
comprehensively  
and systematically  
demonstrates the  
theory and  
practice of  
designing,*

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*synthesizing and  
improving the  
performance of  
fuels. The*

*contents range  
from*

*polycyoalkane  
fuels, strained  
fuels, alky-  
diamondoid fuels,  
hypergolic and  
nanofluid fuels*

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*derived from fossil and biomass. All the chapters together clearly describe the important aspects of high-energy-density fuels including molecular design, synthesis route, physiochemical*

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*properties, and  
their application  
in improving the  
aerocraft  
performance.*

*Vivid schematics  
and illustrations  
throughout the  
book enhance the  
accessibility to  
the relevant  
theory and*

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*technologies. This book provides the readers with fundamentals on high-energy-density fuels and their potential in advanced aerospace propulsion, and also provides the readers with*

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*inspiration for  
new development  
of advanced  
aerospace fuels.*

*Integrated  
Processing  
Technologies for  
Food and  
Agricultural By-  
Products  
Combined  
Application of*

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*Physico-Chemical  
& Microbiological  
Analytical  
Processes for  
Chemistry  
Industrial Effluent  
Treatment Plant  
High-Energy-  
Density Fuels for  
Advanced  
Propulsion  
Reaction  
Dynamics  
Involving Ions,*

*Page 23/257*

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*Radicals, Neutral  
and Excited  
Species*

*Nanocellulose: A  
Multipurpose  
Advanced  
Functional  
Material  
Nanostructured  
Materials for  
Treating Aquatic  
Pollution*



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*Analysing Data,  
Looking for  
Patterns and  
Making*

*Deductions*

**Composite**

**Materials:**

**Properties, Cha  
racterisation,  
and**

**Applications**

**provides an in-**

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**depth  
description of  
the synthesis,  
properties, and  
various characterisation  
techniques used  
for the study  
of composite  
materials.**

**Covers  
applications  
and simulation**

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**tests of these  
advanced  
materials  
Presents real-  
world examples  
for  
demonstration  
Discusses  
surface,  
thermal, and  
electrical char-  
acterisation  
techniques**

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**Covers  
composites for  
use as sensors  
Aimed at  
industry  
professionals  
and  
researchers,  
this book  
offers readers  
thorough  
knowledge of  
the**

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**fundamentals as  
well as  
advanced level  
techniques  
involved in  
composite  
material charac  
terisation,  
development,  
and  
applications.  
In this book we  
explore new**

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**approaches to  
understanding  
the physical  
and chemical  
properties of  
emergent  
complex  
functional  
materials,  
revealing a  
close  
relationship  
between their**

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**structures and  
properties at  
the molecular  
level. The  
primary focus  
of this book is  
on the ability  
to synthesize  
materials with  
a controlled  
chemical  
composition, a  
crystallographi**

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**c structure,  
and a well-  
defined  
morphology.**

**Special  
attention is  
also given to  
the interplay  
of theory,  
simulation and  
experimental  
results, in  
order to**



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**interconnect  
theoretical  
knowledge and  
experimental  
approaches,  
which can  
reveal new  
scientific and  
technological  
directions in  
several fields,  
expanding the  
versatility to**

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**yield a variety**

**of new complex**

**materials with**

**desirable**

**applications**

**and functions.**

**Some of the**

**challenges and**

**opportunities**

**in this field**

**are also**

**discussed,**

**targeting the**

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**development of**

**new emergent**

**complex**

**functional**

**materials with**

**tailored**

**properties to**

**solve problems**

**related to**

**renewable**

**energy, health,**

**and**

**environmental**

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**sustainability.**

**A more**

**fundamental**

**understanding**

**of the physical**

**and chemical**

**properties of**

**new emergent**

**complex**

**functional**

**materials is**

**essential to**

**achieving more**

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**substantial  
progress in a  
number of  
technological  
fields. With  
this goal in  
mind, the  
editors invited  
acknowledged  
specialists to  
contribute  
chapters  
covering a**

**broad range of  
disciplines.  
The search for  
altenative,  
renewable  
sources of fuel  
and energy from  
plants, algae,  
and waste  
materials has  
catalyzed in  
recent years.  
With the**

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**growing  
interest in  
bioenergy  
development and  
production  
there has been  
increasing  
demand for a  
broad ranging  
introductory  
text in the  
field.**

**Bioenergy:**

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**Principles and Practices**  
provides an  
**invaluable**  
**introduction to**  
**the**  
**fundamentals of**  
**bioenergy**  
**feedstocks,**  
**processing, and**  
**industry.**  
**Bioenergy**  
**provides**



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**readers with an understanding of foundational information on 1st, 2nd, and 3rd generation biofuels.**

**Coverage spans from feedstock production of key energy sources such as grasses, canes,**

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**and woody  
plants through  
chemical  
conversion  
processes and  
industrial  
application.  
Each chapter  
provides a  
thorough  
description of  
fundamental  
concepts,**

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**definitions of  
key terms, case  
studies and  
practical  
examples and  
exercises.**

**Bioenergy:  
Principles and  
Practices will  
be an essential  
resource for  
students,  
bioengineers,**

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**chemists, and  
industry**

**personnel tying**

**key concepts of**

**bioenergy**

**science to**

**valuable real**

**world**

**application.**

**Drs. Ullah and**

**Yang hold**

**patents related**

**to cellulose**

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**material. All  
other Topic  
Editors declare  
no competing  
interests with  
regard to the  
Research Topic  
subject. This  
Research Topic  
is dedicated to  
Prof. Lina  
Zhang on the  
occasion of her**

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**80th Birthday,  
in gratitude,  
esteem, and  
affection.**

**Recent Advances  
in Complex  
Functional  
Materials  
Science of  
Advanced  
Materials  
Reaction  
Mechanisms in**

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**Organic  
Chemistry  
Metal-Organic  
Frameworks and  
Covalent  
Organic  
Frameworks  
Advanced  
Functional  
Materials:  
Properties and  
Applications  
March 's**

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**Advanced  
Organic  
Chemistry  
Conjugated  
Polymers**

**An accessible and  
step-by-step  
exploration of  
organic reaction  
mechanisms In  
Reaction  
Mechanisms in  
Organic Chemistry,**



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**eminent researcher**

**Dr. Metin Balcı**

**explains organic**

**reaction mechanisms**

**step-by-step. The**

**book offers a way**

**for undergraduate**

**and graduate**

**students to**

**understand—rather**

**than memorize—the**

**principles of reaction**

**mechanisms. It**

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**includes the most important reaction types, including substitution, elimination, addition, pericyclic, and C-C coupling reactions. Each chapter contains problems and accompanying solutions that cover central concepts in**

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**organic chemistry.**  
**Students will learn to**  
**understand the**  
**foundational nature**  
**of ideas like Lewis**  
**acids and bases,**  
**electron density, the**  
**mesomeric effect,**  
**and the inductive**  
**effect via the use of**  
**detailed examples**  
**and an expansive**  
**discussion of the**

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**concept of hybridization. Along with sections covering aromaticity and the chemistry of intermediates, the book includes: A thorough introduction to basic concepts in organic reactions, including covalent bonding, hybridization,**

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**electrophiles and  
nucleophiles, and  
inductive and  
mesomeric effects**

**Comprehensive  
explorations of  
nucleophilic  
substitution  
reactions, including  
optical activity and  
stereochemistry of  
SN2 reactions**

**Practical discussions**

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**of elimination  
reactions, including  
halogene elimination  
and Hofmann  
elimination In-depth  
examinations of  
addition reactions,  
including the  
addition of water to  
alkenes and the  
epoxidation of  
alkenes Perfect for  
students of**

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**chemistry,  
biochemistry, and  
pharmacy, Reaction  
Mechanisms in  
Organic Chemistry  
will also earn a place  
in the libraries of  
researchers and  
lecturers in these  
fields seeking a one-  
stop resource on  
organic reaction  
mechanisms.**

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**A concise  
introduction to the  
chemistry and design  
principles behind  
important metal-  
organic frameworks  
and related porous  
materials Reticular  
chemistry has been  
applied to synthesize  
new classes of  
porous materials  
that are successfully**



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**used for myriad applications in areas such as gas separation, catalysis, energy, and electronics.**

**Introduction to Reticular Chemistry gives an unique overview of the principles of the chemistry behind metal-organic**

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**frameworks (MOFs),  
covalent organic  
frameworks (COFs),  
and zeolitic  
imidazolate  
frameworks (ZIFs).**

**Written by one of the  
pioneers in the field,  
this book covers all  
important aspects of  
reticular chemistry,  
including design and  
synthesis, properties**

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**and characterization,  
as well as current  
and future  
applications**

**Designed to be an  
accessible resource,  
the book is written in  
an easy-to-  
understand style. It  
includes an extensive  
bibliography, and  
offers figures and  
videos of crystal**

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**structures that are  
available as an  
electronic  
supplement.**

**Introduction to  
Reticular Chemistry:  
-Describes the  
underlying principles  
and design elements  
for the synthesis of  
important metal-  
organic frameworks  
(MOFs) and related**

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**materials -Discusses  
both real-life and  
future applications  
in various fields,  
such as clean energy  
and water adsorption  
-Offers all graphic  
material on a  
companion website  
-Provides first-hand  
knowledge by Omar  
Yaghi, one of the  
pioneers in the field,**

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**and his team. Aimed  
at graduate students  
in chemistry,  
structural chemists,  
inorganic chemists,  
organic chemists,  
catalytic chemists,  
and others,**

**Introduction to  
Reticular Chemistry  
is a groundbreaking  
book that explores  
the chemistry**

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**principles and  
applications of  
MOFs, COFs, and  
ZIFs.**

**March's Advanced  
Organic  
Chemistry Reactions,  
Mechanisms, and  
Structure John Wiley  
& Sons**

**This book offers a  
timely and complete  
overview on chemical**

*Page 63/257*

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**vapour deposition  
(CVD) and its  
variants for the  
processing of  
nanoparticles,  
nanowires,  
nanotubes,  
nanocomposite  
coatings, thin and  
thick films, and  
composites. Chapters  
discuss key aspects,  
from processing,**



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**material structure and properties to practical use, cost considerations, versatility, and sustainability. The author presents a comprehensive overview of CVD and its potential in producing high performance, cost-effective**

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**nanomaterials and  
thin and thick films.  
Features Provides an  
up-to-date  
introduction to CVD  
technology for the  
fabrication of  
nanomaterials,  
nanostructured  
films, and composite  
coatings Discusses  
processing,  
structure,**

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**functionalization,  
properties, and use  
in clean energy,  
engineering, and  
biomedical grand  
challenges Covers  
thin and thick films  
and composites  
Compares CVD with  
other processing  
techniques in terms  
of  
structure/properties,**

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**cost, versatility, and sustainability Kwang-Leong Choy is the Director of the UCL Centre for Materials Discovery and Professor of Materials Discovery in the Institute for Materials Discovery at the University College London. She earned her D.Phil.**

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**from the University  
of Oxford, and is the  
recipient of  
numerous honors**

**including the**

**Hetherington Prize,  
Oxford**

**Metallurgical Society  
Award, and**

**Grinfeld Medal and  
Prize from the**

**Institute of**

**Materials (UK). She**

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**is an elected fellow  
of the Institute of  
Materials, Minerals  
and Mining, and the  
Royal Society of  
Chemistry.**

**Spin States in  
Biochemistry and  
Inorganic Chemistry  
Organic Chemistry  
for Advanced  
Students**

**Current Status and**

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**Future Prospects  
Environmental,  
Analytical  
Chemical and  
Medical Sensors  
Advanced Structural  
Chemistry  
Tailoring Properties  
of Inorganic  
Materials and their  
Applications  
Principles and  
Applications  
The air**

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pollution  
problem  
inevitably  
accompanies

our human  
activities.

Severe air  
pollution  
situations  
have been  
reported,  
especially in



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emerging  
countries, and  
satisfying the  
air quality  
standards  
fully remains  
an underlying  
issue. Today,  
modeling  
research is  
one of the  
more valuable

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approaches to  
understanding  
the behavior  
of air

pollutants,  
and is useful  
for  
regulation-,  
policy- and de  
cision-making.  
Such modeling  
applications

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range, with  
regard to  
horizontal  
grid

resolution,  
from a few km  
(local) to  
hundreds of km  
(regional), to  
thousands of  
km (global).  
To foster our

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current  
scientific  
knowledge on  
modeling  
potentialities  
and  
limitations,  
scientific  
research  
related to  
multi-scale  
air pollution

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modeling is  
collected in  
this book.

This book  
report the  
advances in  
the synthesis  
of new  
nanomaterials  
for the  
remediation of  
natural

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waters,  
groundwaters,  
and  
wastewaters.

The authors  
describe  
synthetic  
routes for the  
assembly of  
different  
nanomaterials  
for the

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removal of  
contaminants  
by adsorption,  
catalytic

degradation,  
and

antibacterial  
activity. The

hazardous  
effects of

nanomaterials  
in aquatic

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ecosystems are discussed.

This book presents the trends in the development of advanced technologies available in the market based on nanomaterials



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for more  
efficient  
water  
remediation.

The authors  
also discuss  
sustainable  
management of  
water  
resources  
according to  
the new

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technologies developed and the improved efficiency of remediation processes.

Contributors of this collection have extensive experience at various field

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of development  
the materials  
and technology  
for advanced  
applications.

This book is a  
result of  
collaboration  
between all  
contributing  
authors who  
agreed to

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share their  
research  
expertise as  
well as

visions for  
the future  
materials  
development.

The four  
volumes of the  
book series  
"Engineering

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Tools for  
Advanced  
Environmental  
Analytical  
Chemistry  
Risk  
Management"  
deal with  
environmental  
management,  
assessment &  
monitoring  
tools,  
environmental  
toxicology and

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risk reduction  
technologies.

This last  
volume focuses  
on engineering  
solutions  
usually needed  
for industrial  
contaminated  
sites, where  
nature's self-  
remediation is

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inefficient or  
too slow. The  
success of  
remediation

depends on the  
selection of  
an increasing  
number of  
conventional  
and innovative  
methods. This  
volume

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classifies the remedial technologies and describes the reactor approach to understand and manage in situ technologies similarly to reactor-based technologies.



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Technology  
types include  
physicochemical,  
biological  
or ecological  
solutions,  
where near-  
natural,  
sustainable  
remediation  
has priority.  
A special

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chapter is  
devoted to  
natural  
attenuation,  
where natural  
changes can  
help achieve  
clean-up  
objectives.

Natural  
attenuation  
and biological

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and ecological  
remediation  
Advanced  
Analytical  
Chemistry  
establish a  
serial range  
of  
technologies  
from  
monitoring  
only to fully  
controlled  
interventions,  
using ' just'

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the natural  
ecosystem or  
sophisticated  
artificial

living  
systems.

Passive  
artificial  
ecosystems and  
biodegradation-  
based  
remediation –

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in addition to  
natural  
attenuation –  
demonstrate  
the use of  
these 'green'  
technologies  
and how  
engineering  
intervention  
should be kept  
at a minimum

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to limit  
damage to the  
environment  
and create a  
harmonious  
ecosystem.  
Remediation of  
sites  
contaminated  
with organic  
substances is  
analyzed in

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detail

including

biological and  
physicochemical  
I methods.

Comprehensive  
management of  
pollution by  
inorganic  
contaminants  
from the  
mining

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industry,  
leaching and  
bioleaching  
and acid mine  
drainage is  
studied in  
general and  
specifically  
in the case of  
an abandoned  
mine in  
Hungary where



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the innovative  
technology of  
combined  
chemical and p  
hytostabilizat  
ion has been  
applied. The  
series of  
technologies  
is completed  
by electrochem  
ical

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remediation  
and nanotechno  
logies.

Monitoring,  
verification  
and  
sustainability  
analysis of  
remediation  
provide a  
comprehensive  
overview of

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the management  
aspect of  
environmental  
risk reduction  
by  
remediation.

This book  
series focuses  
on the state  
of knowledge  
about the  
environment

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and its  
conscious and  
structured  
application in  
environmental  
engineering,  
management and  
decision  
making.

Photomechanica  
I Materials,  
Composites,

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and Systems  
Advanced  
Drug &  
Analytical  
Chemistry  
Markets

Pollution

Control

Technologies

From Design to

Application

Wearable

Energy Storage

Devices

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Nanoparticle  
Design and Cha  
racterization  
for Catalytic  
Applications  
in Sustainable  
Chemistry  
Influence on  
Structure and  
Reactivity

**The completely  
revised and**

*Page 102/257*

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**updated,  
definitive  
resource for  
students and  
professionals in  
organic  
chemistry The  
revised and  
updated 8th  
edition of  
March's  
Advanced**

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**Organic  
Chemistry:  
Reactions,  
Mechanisms,  
and Structure  
explains the  
theories of  
organic  
chemistry with  
examples and  
reactions. This  
book is the most**



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**comprehensive  
resource about  
organic  
chemistry  
available.**

**Readers are  
guided on the  
planning and  
execution of  
multi-step  
synthetic  
reactions, with**

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**detailed  
descriptions of  
all the reactions  
The opening  
chapters of  
March's  
Advanced  
Organic  
Chemistry, 8th  
Edition deal  
with the  
structure of**

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**organic  
compounds and  
discuss  
important  
organic  
chemistry  
bonds,  
fundamental  
principles of  
conformation,  
and  
stereochemistry**

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**of organic  
molecules, and  
reactive  
intermediates in  
organic  
chemistry.  
Further  
coverage  
concerns  
general  
principles of  
mechanism in**

*Page 108/257*

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**organic  
chemistry,  
including acids  
and bases,  
photochemistry,  
sonochemistry  
and microwave  
irradiation. The  
relationship  
between  
structure and  
reactivity is also**

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**covered. The  
final chapters  
cover the nature  
and scope of  
organic  
reactions and  
their  
mechanisms.**

**This edition:  
Provides revised  
examples and  
citations that**

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**reflect advances**

**in areas of**

**organic**

**chemistry**

**published**

**between 2011**

**and 2017**

**Includes**

**appendices on**

**the literature of**

**organic**

**chemistry and**

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**the  
classification of  
reactions  
according to the  
compounds  
prepared  
Instructs the  
reader on  
preparing and  
conducting  
multi-step  
synthetic**



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**reactions, and  
provides  
complete  
descriptions of  
each reaction  
The 8th edition  
of March's  
Advanced  
Organic  
Chemistry  
proves once  
again that it is a**

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**must-have  
desktop  
reference and  
textbook for  
every student  
and professional  
working in  
organic  
chemistry or  
related fields.  
To an increasing  
extent, "green**

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**chemistry" is a  
new chemical  
and engineering  
approach of  
chemistry and  
engineering,  
dedicated to  
make  
manufacturing  
processes and  
our world as a  
whole more**

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**sustainable  
world with a  
growing  
tendency.**

**"Green  
chemistry"  
approaches are  
based on  
ecofriendly  
technologies,  
aiming to  
reduce or**

**eliminate the  
use of solvents,  
or render them  
efficient and  
safer. Moreover,  
this scientific  
field is devoted  
to reduction or  
elimination of  
prevailing  
environmental  
and health**

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**threats, which  
typically  
accompany  
chemical  
products and  
traditional  
processes. The  
present book  
"Green  
Chemistry"  
contains 9  
selected**

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**chapters,  
starting with a  
general  
introductory  
chapter on  
"green  
chemistry," and  
covers many  
recent  
applications and  
developments  
based on the**

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**principles of  
"green  
chemistry." This  
book is  
considered the  
appropriate way  
to communicate  
the advances in  
green materials  
and their  
applications to  
the scientific**



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**community.  
Chemists,  
scientists and  
researchers  
from related  
areas, and  
undergraduates  
involved in  
environmental  
issues and  
interested in  
approaches to**

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**improve the  
quality of life  
could find an  
inspiring and  
effective guide  
by reading this  
book.**

**This book  
covers the  
fundamentals of  
sensor  
technologies as**

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**well as the  
recent research  
for the  
development of  
environmental,  
chemical and  
medical sensor  
technologies.  
Chapters  
include current  
research on  
microflow**

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**cytometry,  
microfluidic  
devices,  
colorimetric  
sensors, and the  
development of  
low-cost optical  
densitometric  
sensors and  
paper based  
analytical  
devices for**

*Page 124/257*

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**environmental  
and biomedical  
applications.  
Special focus  
has been given  
to  
nanotechnology  
and  
nanostructures-  
their  
fabrication,  
uses and utility**

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**in different  
fields of  
research such  
as for the  
design of tools  
for medical  
diagnostics,  
therapeutics, as  
well as for  
detection and  
estimation of  
pollutant levels**

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**in water and air  
quality  
monitoring. This  
book is intended  
as a resource  
for researchers  
working in the  
field of sensor  
development  
across the  
world.**

**A guide to**

*Page 127/257*

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**industrially  
relevant  
products and  
processes for  
transportation  
fuels The  
Handbook of  
Fuels offers a  
comprehensive  
review of the  
wide variety of  
fuels used to**

*Page 128/257*



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**power vehicles,**

**aircraft and**

**ships and**

**examines the**

**processes to**

**produce these**

**fuels. The**

**updated second**

**edition reflects**

**the growing**

**importance of**

**fuels and fuel**

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**additives from  
renewable  
sources. New  
chapters include  
information on  
current  
production  
technology and  
use of  
bioethanol,  
biomethanol  
and biomass-to-**

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**liquid fuels. The book also reviews novel additives and performance enhancers for conventional engines and fuels for novel hybrid engines. This comprehensive**

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**resource  
contains critical  
information on  
the legal,  
safety, and  
environmental  
issues  
associated with  
the production  
and use of fuels  
as well as  
reviewing**

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**important  
secondary  
aspects of the  
use and  
production of  
fuels. This  
authoritative  
guide includes  
contributions  
from authors  
who are long-  
standing**

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**contributors to  
the Ullmann's  
Encyclopedia,  
the world's most  
trusted  
reference for  
industrial  
chemistry. This  
important  
guide: Contains  
an updated  
edition of the**

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**authoritative  
resource to the  
production and  
use of fuels  
used for  
transportation  
Includes  
information that  
has been  
selected to  
reflect only  
commercially**

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**relevant  
products and  
processes  
Presents  
contributions  
from a team of  
noted experts in  
the field Offers  
the most recent  
developments in  
fuels and  
additives from**



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**renewable  
sources Written  
for**

**professionals in  
the fields of  
fossil and  
renewable fuels,  
engine design,  
and**

**transportation,  
Handbook of  
Fuels is the**

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**comprehensive**

**resource that**

**has been**

**revised to**

**reflect the**

**recent**

**developments in**

**fuels used for**

**transportation.**

**Air Pollution**

**Modelling**

**Wireless**

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**Transduction of  
Light into Work  
Chemical  
Vapour**

**Deposition  
(CVD)**

**Problems and  
Problem Solving  
in Chemistry  
Education**

**Local-,  
Regional-, and**

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Application  
Methodologies  
and Applications  
for Analytical  
and Physical  
Chemistry  
Plasma Science  
and Technology**

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presents an up-to-  
date review of

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modern materials  
and concepts,  
issues, and recent  
advances in  
analytical and  
physical chemistry.  
Distinguished  
scientists and  
engineers from key  
institutions  
worldwide have  
contributed  
chapters that

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provide a deep  
analysis of their  
particular subjects.

The chapters  
discuss the  
composition and  
properties of  
complex materials  
as well as mixtures,  
processes, and the  
need for new and  
improved analytical  
technology.

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Polymers, Two-  
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definitive resource  
on the topic of  
conducting  
polymers.

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comprising the  
comprehensive  
Handbook,

Conjugated  
Polymers:

Perspective, Theory,  
and New Materials

features new  
chapters on the  
fundamental theory  
and new materials  
involved in  
conducting

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polymers. It discusses the history of physics and chemistry of these materials and the theory behind them. Finally, it details polymer and materials chemistry including such topics as conjugated block copolymers, metal-

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containing  
conjugated  
polymers, and  
continuous flow  
processing. Aimed  
at researchers,  
advanced students,  
and industry  
professionals  
working in  
materials science  
and engineering,  
this book covers

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fundamentals,  
recent progress,  
and new materials

involved in

conducting

polymers and

includes a wide-

ranging listing of

comprehensive

chapters authored

by an international

team of experts.

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addressing the relationship between the structure and function of matter, efficient and precise synthesis methodology, and theoretical tools for new functional clusters and porous materials.

Synthetic Sorbent

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Materials Based on  
Metal Sulphides  
and Oxides focuses  
on development of  
inorganic  
nanomaterials for  
removal of metallic  
species from the  
aqueous  
environment.

General synthetic  
methods to prepare  
such materials are

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lacking. This book investigates problems of controlled synthesis of these materials and the effect of their morphological characteristics on their sorption capacity. •

Synthesizes experimental data on the synthesis of

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micro- and  
nanoparticles of  
zinc, copper, and  
cadmium sulfides,  
iron oxides, and  
manganese  
oxyhydroxide. •

Discusses  
controlled synthesis  
of zinc, cadmium,  
and copper sulfide  
particles and their  
sorption properties.



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- Describes production of iron oxides (hematite and magnetite) and manganese oxyhydroxide particles. • Features numerous SEM images of the obtained nanostructures and original graphs of various

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characteristics. •

Offers practical  
recommendations.

This book is of  
interest to  
researchers and  
scientists working  
with inorganic  
synthesis and  
properties of  
sorption materials.

4. Risk Reduction  
Technologies and

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Case Studies  
Advanced  
Target Discovery for  
Analytical  
Anticancer Therapy  
Chemistry  
Facilitated by  
Artificial  
Intelligence  
Reactions,  
Principles, and  
Techniques  
Perspective, Theory,  
and New Materials  
Reactions,  
Mechanisms, and

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Structure

Tietz Textbook of  
Analytical  
Laboratory

Medicine - E-Book

Photosynthetic

Protein-Based

Photovoltaics

**An exhaustive  
review of the  
history,  
current state,  
and future  
opportunities**

*Page 156/257*

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for harnessing

light to

accomplish

useful work in

materials, this

book describes

the chemistry,

physics, and

mechanics of li

ght-controlled

systems. •

Describes

photomechanical

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materials and

mechanisms,

along with key

applications •

Exceptional

collection of

leading

authors,

internationally

recognized for

their work in

this growing

area • Covers

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the full scope

of

photomechanical

materials:

polymers,

crystals,

ceramics, and

nanocomposites

• Deals with an

interdisciplina

ry coupling of

mechanics,

materials,

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chemistry, and  
physics •

Emphasizes

application

opportunities

in creating

adaptive

surface

features, shape

memory devices,

and actuators;

while assessing

future



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prospects for

utility in

optics and

photonics and

soft robotics

This book gives

an overview of

the state of

the art in

Catalytic Wet

Peroxide

Oxidation

research for

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the treatment  
of industrial  
and urban  
wastewaters and  
provides novel  
solutions to  
overcome the  
current  
challenges of  
this  
technology.  
These solutions  
include

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tailoring of  
the catalysts  
to exploit the  
use of

additional  
energy sources  
and oxidants.

The collected  
papers  
illustrate the  
high

versatility of  
this low-cost

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technology,

Advanced  
easily

Analytical  
adaptable to

Chemistry  
any kind of

wastewater,

either polluted

by high-loaded

recalcitrant

organics in

industrial

wastewaters or

by emerging

pollutants at m

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microconcentration levels in urban waters.

It has long been recognized that metal spin states play a central role in the reactivity of important biomolecules, in industrial catalysis and

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in spin  
crossover  
compounds. As  
the fields of  
inorganic  
chemistry and  
catalysis move  
towards the use  
of cheap, non-  
toxic first row  
transition  
metals, it is  
essential to

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understand the  
important role  
of spin states  
in influencing  
molecular  
structure,  
bonding and  
reactivity.

Spin States in  
Biochemistry  
and Inorganic  
Chemistry  
provides a

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complete  
picture on the  
importance of  
spin states for  
reactivity in  
biochemistry  
and inorganic  
chemistry,  
presenting both  
theoretical and  
experimental  
perspectives.  
The successes



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and pitfalls of  
theoretical  
methods such as  
DFT, ligand-  
field theory  
and coupled  
cluster theory  
are discussed,  
and these  
methods are  
applied in  
studies  
throughout the

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book. Important  
spectroscopic  
techniques to  
determine spin  
states in  
transition  
metal complexes  
and proteins  
are explained,  
and the use of  
NMR for the  
analysis of  
spin densities

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is described.  
Advanced  
Topics covered  
Analytical  
include: DFT  
Chemistry  
and ab initio  
wavefunction  
approaches to  
spin states  
Experimental  
techniques for  
determining  
spin states  
Molecular  
discovery in

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spin crossover

Multiple spin  
state scenarios  
in

organometallic  
reactivity and  
gas phase  
reactions Trans  
ition-metal  
complexes  
involving redox  
non-innocent  
ligands

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**Polynuclear  
iron sulfur  
clusters**

**Molecular**

**magnetism NMR**

**analysis of**

**spin densities**

**This book is a**

**valuable**

**reference for**

**researchers**

**working in**

**bioinorganic**

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and inorganic

chemistry,

computational

chemistry,

organometallic

chemistry,

catalysis, spin-

crossover

materials,

materials

science,

biophysics and

pharmaceutical

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chemistry.

This book  
outlines the  
methodologies,  
approaches and  
tools for  
modelling  
chemicals in a  
Life Cycle  
Assessment  
(LCA)  
perspective,  
and also covers

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the main  
advantages and  
drawbacks of  
applying LCA to  
chemical  
processes. In  
the first part  
of this book,  
authors pay  
close attention  
to the  
limitations of  
modelling the



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environmental

and social

impacts of

chemical

processes,

providing

valuable

insights to the

problems of the

Life Cycle

Inventory (LCI)

analysis for

chemical

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processes. In the second part of this book, readers will learn about the LCA application to chemical processes in the laboratory and industrial scale. In each chapter of this book, readers

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will also find  
specific case  
studies on the  
modelling and  
application of  
LCA in the  
chemical  
industry.  
Synthetic  
Sorbent  
Materials Based  
on Metal  
Sulphides and

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**Oxides**

**Introduction to**

**Reticular**

**Chemistry**

**Bioenergy**

**Composite**

**Materials**

**Properties, Cha**

**racterisation,**

**and**

**Applications**

**Advances,**

**Technology and**

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Applications

**p="" This monograph is based on pollution control technologies available to deal with water and air pollution. It includes removal of**

**variety of  
pollutants  
including  
arsenic,  
chromium,  
uranium,  
pesticides and  
arsenic from  
water using  
adsorption  
technique. In  
addition, this**

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**book deals with  
the sampling  
and removal of  
microplastics  
using various  
techniques. The  
contents also  
focus on the  
role of  
membrane  
technology in  
water and**

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**wastewater  
treatment, and  
particulate  
matter air  
pollution and its  
control  
techniques. This  
volume will be a  
useful guide for  
researchers,  
academics and  
scientists. ^**



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**Feeding our  
globally  
expanding  
population is  
one of the most  
critical  
challenges of  
our time and  
improving food  
and agricultural  
production  
efficiencies is a**

**key factor in  
solving this  
problem.**

**Currently, one-  
third of food  
produced for  
humans is  
wasted, and for  
every pound of  
food produced,  
roughly an  
equal amount of**

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**nonfood by-product is also generated, creating a significant environmental impact. In Integrated Processing Technologies for Food and Agricultural By-**

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**Products  
experts from  
around the  
world present  
latest  
developments,  
recognizing that  
while some by-  
products have  
found use as  
animal feed or  
are combusted**

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**for energy, new technologies which integrate conversion of production and processing by-products into higher-value food or nonfood products, nutraceuticals, chemicals, and**

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**energy resources will be a critical part of the transition to a more sustainable food system.**

**Organized by agricultural crop, and focusing on those crops with**

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**maximum  
economic  
impact, each  
chapter  
describes  
technologies for  
value-added  
processing of by-  
products which  
can be  
integrated into  
current food**

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**production  
systems.**

**Integrated  
Processing**

**Technologies for  
Food and**

**Agricultural By-  
Products is a**

**valuable**

**resource for  
industry**

**professionals,**

*Page 192/257*



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**academics, and  
policy-makers  
alike. Provides p  
roduction-throu  
gh-processing  
coverage of key  
agricultural  
crops for a  
thorough  
understanding  
and  
translational**

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**inspiration  
Describes and  
discusses major  
by-product  
sources,  
including  
physical and  
chemical  
biomass charact  
erizations and  
associated  
variability in**

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**detail**

**Highlights**

**conversions**

**accomplished**

**through**

**physical,**

**biological,**

**chemical, or**

**thermal**

**methods and**

**demonstrates**

**examples of**

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**those  
technologies  
Ever since the  
discovery of the  
photoelectric  
effect,  
researchers  
have been trying  
to improve the  
efficiency of  
converting  
sunlight into**

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**electricity  
through  
photovoltaic  
devices.**

**Photosynthetic  
organisms  
provide clues for  
harvesting  
sunlight and  
storing the  
energy in  
chemical forms.**

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434, Fall 2016

**This book offers  
a concise  
overview of the  
fundamental  
concepts of  
photosynthesis  
and the  
emerging  
photovoltaic  
technologies,  
casting light on  
the symbiotic**

*Page 198/257*

**relation between  
these spheres of  
science.**

**Although there  
are many books  
about the  
fundamentals of  
photosynthesis  
and the various  
aspects of the  
photosynthetic  
processes, this**

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**is the first**

**volume to focus**

**on the prospects**

**of studying the**

**photosynthetic**

**proteins,**

**understanding**

**and applying**

**their properties**

**to design**

**prospective**

**solar energy**



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**conversion devices that are sustainable and efficient. All in all, the book aims to bring together the present know-how on organic photovoltaics and dye-sensitized solar**

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**cells with that of  
the emerging  
bio-  
photovoltaics  
and the  
underlying  
physics of  
photosynthesis  
to foster a more  
eclectic  
research that  
would converge**

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**towards a  
sustainable  
energy  
technology for  
the future. The  
book mainly  
serves as a  
bridge to  
connect  
biochemists,  
who study  
photosynthetic**

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**proteins, and  
physicists and  
engineers who  
design and  
develop  
photovoltaic  
devices.**

**Scientists,  
engineers and  
students in the  
fields of  
photosynthetic**

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**research and  
solar energy  
research can  
use this book as  
a ready**

**reference. Key  
selling features:**

**Covers both  
methods and bio-  
based materials  
needed to build  
bio-based**

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**photovoltaics**

**Focuses on both  
techniques and  
applications**

**Summarizes the  
advantages and  
limitations of  
various**

**techniques**

**Contributors  
from multiple  
disciplines**

*Page 206/257*

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**integrate the  
knowledge of  
photosynthetic  
proteins and the  
physics/enginee  
ring of  
photovoltaic  
devices.**

**Includes  
adaptive designs  
and techniques  
used in other**

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**types of solar  
cells to for the  
design of  
protein-based  
PVs**

**Use THE  
definitive  
reference for  
laboratory  
medicine and  
clinical  
pathology! Tietz**

*Page 208/257*



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**Textbook of  
Laboratory  
Analytical  
Chemistry  
Medicine, 7th  
Edition provides  
the guidance  
necessary to  
select, perform,  
and evaluate the  
results of new  
and established  
laboratory tests.  
Comprehensive**

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**coverage  
includes the  
latest advances  
in topics such as  
clinical  
chemistry,  
genetic  
metabolic  
disorders,  
molecular  
diagnostics,  
hematology and**

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**coagulation,  
clinical  
microbiology,  
transfusion**

**medicine, and  
clinical**

**immunology.**

**From a team of  
expert**

**contributors led  
by Nader Rifai,  
this reference**

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to wide-ranging  
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**featuring the  
comprehensive  
product with  
fully searchable  
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content updates,  
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timely, and  
efficient**

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**manner;  
provides  
expertise in  
managing  
clinical  
laboratory  
needs; and  
shows how to be  
responsive to an  
ever-changing  
environment.  
Current**

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**guidelines help  
you select,  
perform, and  
evaluate the  
results of new  
and established  
laboratory tests.  
Expert,  
internationally  
recognized  
chapter authors  
present**

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**guidelines**

**representing**

**different**

**practices and**

**points of view.**

**Analytical**

**criteria focus on**

**the medical**

**usefulness of**

**laboratory**

**procedures. Use**

**of standard and**



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any user,  
anywhere in the  
world. Expert  
Consult provides  
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as a fully  
searchable  
eBook, and**

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**includes regular  
content updates,  
animations,  
podcasts, more  
than 1300  
clinical case  
studies, over  
2500 multiple-  
choice  
questions, a  
lecture series,  
and more. NEW!**

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**19 additional  
chapters  
highlight  
various  
specialties  
throughout  
laboratory  
medicine. NEW!  
Updated, peer-  
reviewed  
content provides  
the most**

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information  
possible. NEW!  
The largest-ever  
compilation of  
clinical cases in  
laboratory  
medicine is  
included on  
Expert Consult.  
NEW! Over 100  
adaptive**

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the opportunity  
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for**

**Transportation  
Engineering**

**Tools for**

**Environmental**

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**Risk  
Management  
Design and  
Synthesis  
Basic  
Fundamentals  
and Modern  
Applications  
Progress in  
Medicinal  
Chemistry  
Green**

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**Chemistry**  
**Trends in**  
**Catalytic Wet**  
**Peroxide**  
**Oxidation**  
**Processes**  
*Usually called*  
*the "fourth*  
*state of*  
*matter,"*  
*plasmas make*  
*up more than*

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**99% of known**

**material. In**

**usual**

**terminology,**

**this term**

**generally**

**refers to**

**partially or**

**totally ionized**

**gas and covers**

**a large**

**number of**



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***topics with  
very different  
characteristics  
and behaviors.***

***Over the last  
few decades,  
the physics  
and  
engineering of  
plasmas was  
experiencing a  
renewed***

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***interest,  
essentially  
born of a  
series of  
important  
applications  
such as thin-  
layer  
deposition,  
surface  
treatment,  
isotopic***

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***separation,  
integrated  
circuit  
etchings,  
medicine, etc.  
Plasma  
Science  
Flexible and  
stretchable  
energy storage  
devices are  
increasingly***

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***being needed***

***for a wide***

***variety of***

***applications***

***such as***

***wearable***

***electronics,***

***electronic***

***papers,***

***electronic***

***skins, smart***

***clothes,***

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***bendable  
smart phones  
and  
implantable  
medical  
devices.***

***Wearable  
Energy  
Storage  
Devices  
discusses  
flexible and***

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***stretchable supercapacitors and batteries, stretchable and self-healing gel electrolytes, and hybrid wearable energy storage-harvesting devices.***

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***In recent decades, scientific insight into the chemistry of water has increased enormously, leading to the development of advanced wastewater***

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***and water  
purification  
technologies.  
However, the  
quality of  
freshwater  
resources has  
continually  
deteriorated  
worldwide,  
both in  
industrialized***



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***and  
developing  
countries.  
Although  
traditional  
wastewater  
technologies  
focus on the  
removal of  
suspended  
solids,  
nutrients and***

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***bacteria,  
hundreds of  
organic  
pollutants  
occur in  
wastewater  
and urban  
surface  
waters. These  
new pollutants  
are synthetic  
or naturally***

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***occurring  
chemicals that  
are not often  
monitored in  
the  
environment  
but have the  
potential to  
enter the  
environment  
and cause  
known or***

***suspected  
adverse  
ecological and  
/ or human  
health effects.  
Collectively  
referred to as  
the "emerging  
contaminants,  
" they are  
mostly derived  
from domestic***

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***use and occur  
in trace  
concentrations  
ranging from  
pico to  
micrograms  
per liter.***

***Environmental  
contaminants  
are resistant  
to  
conventional***

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**wastewater  
treatment  
processes and  
most of them  
remain  
unaffected,  
leading to the  
contamination  
of the  
receiving  
water. As such,  
there is a need**

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***for advanced  
wastewater  
treatment  
process that is  
capable of  
removing  
environmental  
contaminants  
to ensure safe  
fresh water  
supplies. This  
book explains***

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***the biological  
and chemical  
wastewater  
treatment  
technologies.  
The biological  
wastewater  
treatment  
processes  
presented  
include: (1)  
bioremediatio***



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***n of  
wastewater  
such as  
aerobic and  
anaerobic  
treatment; (2)  
phytoremediat  
ion of  
wastewater  
using  
engineered  
wetlands,***

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***rhizofiltration, rhizodegradation, phytodegradation, phytoaccumulation, phytotransformation and hyperaccumulators ; and (3) mycoremediation of wastewater.***

***The chemical***

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**wastewater  
treatment  
processes  
discussed**

**include**

**chemical**

**precipitation,**

**ion exchange,**

**neutralization,**

**adsorption and**

**disinfection.**

**In addition,**

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***the book describes wastewater treatment plants in terms of plant size, layout and design as well as installation location. Also presenting the***

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***latest,  
innovative  
effluent water  
treatment  
processes, it is  
a valuable  
resource for  
biochemical  
and  
wastewater  
treatment  
engineers,***

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***environmental  
scientists and  
environmental  
microbiologist  
s.***

***Nanoparticles  
exhibit a range  
of different  
properties  
when  
compared to  
bulk materials.***

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***Their high surface-area to volume ratio makes them particularly attractive for use as catalysts and recent years have seen an explosion of research in***

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***this area. The ability to fine-tune the size and structure of nanoparticles means that it is possible to design catalytic materials for improved***



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***activity or  
specificity. As  
catalysis is one  
of the key  
technologies  
for more  
sustainable  
production of  
both  
chemicals and  
energy, the  
past few years***

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***have seen  
increasing  
numbers of  
nanomaterials  
reported for  
these  
applications.  
Depending on  
the  
application, a  
number of  
different***

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***catalyst  
synthesis and  
optimization  
protocols can  
be used. This  
book provides  
comprehensive  
links between  
the design and  
fabrication  
method for  
nanoparticles***

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***and their  
catalytic  
performance  
(activity,  
selectivity and  
stability) in  
various  
applications.  
Presenting an  
introduction  
to the concept  
of catalyst***

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***design and  
recent  
developments  
in the  
preparation  
and characteri-  
sation of  
nanomaterials,  
followed by  
several  
chapters on  
the design of***

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***catalysts for  
specific  
applications,  
this book is a  
valuable  
resource for  
researchers  
working on  
catalytic  
reactions,  
industrial  
processes and***

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***nanomaterial  
applications.  
Challenges, M  
ethodological  
Approaches  
and  
Applications  
Life Cycle  
Assessment in  
the Chemical  
Product Chain  
Handbook of***

*Page 255/257*

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***Fuels  
Practical  
Synthetic  
Organic  
Chemistry  
Papers  
Presented at  
the 1988 ASM  
Materials  
Science  
Seminar,  
26-29***



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**September**  
**1988, Chicago,**  
**Illinois**

Advanced  
Analytical  
Chemistry