

Chapter 22 Hydrocarbon Compounds

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Arkose Press

Millions of Americans use e-cigarettes. Despite their popularity, little is known about their health effects. Some suggest that e-cigarettes likely confer lower risk compared to combustible tobacco cigarettes, because they do not expose users to toxicants produced through combustion. Proponents of e-cigarette use also tout the potential benefits of e-cigarettes as devices that could help combustible tobacco cigarette smokers to quit and thereby reduce tobacco-related health risks. Others are concerned about the exposure to potentially toxic substances contained in e-cigarette emissions, especially in individuals who have never used tobacco products such as youth and young adults. Given their relatively recent introduction, there has been little time for a scientific body of evidence to develop on the health effects of e-cigarettes. Public Health Consequences of E-Cigarettes reviews and critically assesses the state of the emerging evidence about e-cigarettes and health. This report makes recommendations for the improvement of this research and highlights gaps that are a priority for future research.

Carbon in Earth's Interior Academic Press

This book provides an unparalleled contemporary assessment of hydrocarbon chemistry – presenting basic concepts, current

research, and future applications. •

Comprehensive and updated review and discussion of the field of hydrocarbon chemistry • Includes literature coverage since the publication of the previous edition • Expands or adds coverage of: carboxylation, sustainable hydrocarbons, extraterrestrial hydrocarbons • Addresses a topic of special relevance in contemporary science, since hydrocarbons play a role as a possible replacement for coal, petroleum oil, and natural gas as well as their environmentally safe use • Reviews of prior edition: “...literature coverage is comprehensive and ideal for quickly reviewing specific topics...of most value to industrial chemists...” (Angewandte Chemie) and “...useful for chemical engineers as well as engineers in the chemical and petrochemical industries.” (Petroleum Science and Technology)

Fluorine in Organic Chemistry CRC Press

Since the early 1970s, experts have recognized that petroleum pollutants were being discharged in marine waters worldwide, from oil spills, vessel operations, and land-based sources. Public attention to oil spills has forced improvements. Still, a considerable amount of oil is discharged yearly into sensitive coastal environments. Oil in the Sea provides the best available estimate of oil pollutant discharge into marine waters, including an evaluation of the methods for assessing petroleum load and a discussion about the concerns these loads represent. Featuring close-up looks at the Exxon Valdez spill and other notable events, the book identifies important research questions and makes recommendations for better analysis of “and more effective measures against” pollutant discharge. The book discusses: Input “where the discharges come from, including the role of two-stroke engines used on recreational craft. Behavior or fate “how oil is affected by processes such as evaporation as it moves through the marine environment. Effects “what we know about the effects of petroleum hydrocarbons on marine organisms and ecosystems.

Providing a needed update on a problem of international importance, this book will be of interest to energy policy makers, industry officials and managers, engineers and researchers, and advocates for the marine environment.

A Modern Comprehensive Treatise. Aromatic compounds. Part D: Monobenzenoid and phenolic

aralkyl compounds, their derivatives and oxidation products; depsides, tannins, lignans, lignin and humic acid. Part E: Monobenzenoid compounds with unsaturated or polyhydroxylated side-chains, their derivatives and oxidation products. Part F: Polybenzenoid compounds; hydrocarbon ring assemblies; polyphenyl-substituted aliphatic compounds (partial: chapter 20-22 in this volume) Astm International

The sources, distributions, and transformation of organic compounds in the solar system are active study areas as a means to provide information about the evolution of the solar system and the possibilities of life elsewhere in the universe. There are many organic synthesis processes, however, and ambiguity surrounds the relative effectiveness of these processes in explaining the distribution of organic compounds in the solar system. As a consequence, NASA directed the NRC to determine what processes account for the reduced carbon compounds found throughout the solar system and to examine how planetary exploration can advance understanding of this central issue. This report presents a discussion of the chemistry of carbon; an analysis of the formation, modification, and preservation of organic compounds in the solar system; and an assessment of research opportunities and strategies for enhancing our understanding of organic material in the solar system.

A Comparative Study of Environmental Fate, Effects, and Response National Academies Press

The third edition of *Fundamental Concepts of Environmental Chemistry* discusses the influence of environmental factors on living organisms and their nonliving surroundings with special reference to issues related to human health. Topics like energy conservation, acid rain, catalytic converters, delimitation of lakes, ozone depletion, eutrophication, natural fungicides and waste management, which have a bearing on the progress of the society are also incorporated. The schedule of toxic chemicals includes polynuclear aromatic hydrocarbons, methyl isocyanate, heavy metals and cyanides. Updated references and relevant websites are provided at the end of each chapter. New to the third edition are chapters on: - Hydrocarbons - Groundwater Pollution - Mining Operations - Light Pollution Oil in the Sea III John Wiley & Sons Carbon in Earth's fluid envelopes - the atmosphere, biosphere, and hydrosphere, plays a fundamental role in our planet's

climate system and a central role in biology, the environment, and the economy of earth system. The source and original quantity of carbon in our planet is uncertain, as are the identities and relative importance of early chemical processes associated with planetary differentiation. Numerous lines of evidence point to the early and continuing exchange of substantial carbon between Earth's surface and its interior, including diamonds, carbon-rich mantle-derived magmas, carbonate rocks in subduction zones and springs carrying deeply sourced carbon-bearing gases. Thus, there is little doubt that a substantial amount of carbon resides in our planet's interior. Yet, while we know it must be present, carbon's forms, transformations and movements at conditions relevant to the interiors of Earth and other planets remain uncertain and untapped. Volume highlights include: - Reviews key, general topics, such as carbonate minerals, the deep carbon cycle, and carbon in magmas or fluids - Describes new results at the frontiers of the field with presenting results on carbon in minerals, melts, and fluids at extreme conditions of planetary interiors - Brings together emerging insights into carbon's forms, transformations and movements through study of the dynamics, structure, stability and reactivity of carbon-based natural materials - Reviews emerging new insights into the properties of allied substances that carry carbon, into the rates of chemical and physical transformations, and into the complex interactions between moving fluids, magmas, and rocks to the interiors of Earth and other planets - Spans the various chemical redox states of carbon, from reduced hydrocarbons to zero-valent diamond and graphite to oxidized CO₂ and carbonates - Captures and synthesizes the exciting results of recent, focused efforts in an emerging scientific discipline - Reports advances over the last decade that have led to a major leap forward in our understanding of carbon science - Compiles the range of methods that can be tapped from the deep carbon community, which includes experimentalists, first principles theorists, thermodynamic modelers and geodynamicists - Represents a reference point for future deep carbon science research Carbon in Planetary Interiors will be a valuable resource for researchers and students who study the Earth's interior. The topics of this volume are interdisciplinary, and therefore will be useful to professionals from a wide variety of fields in the Earth Sciences, such as mineral physics, petrology, geochemistry, experimentalists, first

principles theorists, thermodynamics, material science, chemistry, geophysics and geodynamics.

Methods and Results National Academies Press

This timely reference presents the state of the art of the emerging and rapidly changing field of bioremediation of chlorinated solvents, PCBs, and other chlorinated compounds, as well as PAHs, both in situ and on site. This landmark publication reports significant advances in bioremediation, with an emphasis on practical applications and state-of-the-art developments. Laboratory and field-oriented reviews are presented with the objective of tying treatability studies and recent laboratory developments to field applications. No other reference source gives you access to the most current techniques and methods for the bioremediation of chlorinated and polycyclic aromatic hydrocarbon compounds. This book represents the work of leading experts in the fields of in situ and on-site bioremediation from North America, Europe, and Asia. The chapters include current field applications and laboratory studies undertaken, in some cases, in countries with regulatory standards more stringent than those of the United States.

Polycyclic Hydrocarbons Academic Press

Thermophysical Properties of Chemicals and Hydrocarbons William Andrew

Subsurface Restoration William Andrew Hydrocarbons and their transformations play major roles in chemistry as raw materials and sources of energy.

Diminishing petroleum supplies, regulatory problems, and environmental concerns constantly challenge chemists to rethink and redesign the industrial applications of hydrocarbons. Written by Nobel Prize-winner George Olah and hydrocarbon expert Árpád Molnár, the completely revised and expanded Second Edition of Hydrocarbon Chemistry provides an unparalleled contemporary assessment of the field, presenting basic concepts, current research, and future applications. Hydrocarbon Chemistry begins by discussing the general aspects of hydrocarbons, the separation of hydrocarbons from natural sources, and the synthesis from C₁ precursors with recent developments for possible future applications. Each successive chapter deals with a specific type of hydrocarbon transformation. The Second Edition includes a new section on the chemical reduction of carbon dioxide – focusing on

catalytic, ionic, electrocatalytic, photocatalytic, and enzymatic reductions – as well as a new chapter on new catalysts and activation methods, combinatorial chemistry, and environmental chemistry.

Other topics covered include: Major processes of the petrochemical industry, such as cracking, reforming, isomerization, and alkylation Derivation reactions to form carbon-heteroatom bonds Hydrocarbon oxidations Metathesis Oligomerization and polymerization of hydrocarbons All chapters have been updated by adding sections on recent developments to review new advances and results. Essential reading for practicing scientists in industry, polymer and catalytic chemists, as well as researchers and graduate students, Hydrocarbon Chemistry, Second Edition remains the benchmark text in its field.

Design and Operation of Human Locomotion Systems Pergamon

For many years, the subject matter encompassed by the title of this book was largely limited to those who were interested in the two most economically important organic materials found buried in the Earth, namely, coal and petroleum. The point of view of any discussions which might occur, either in scientific meetings or in books that have been written, was, therefore, dominated largely by these interests. A great change has occurred in the last decade. This change had as its prime mover our growing knowledge of the molecular architecture of biological systems which, in turn, gave rise to a more legitimate asking of the question: "How did life come to be on the surface of the Earth?" A second motivation arose when the possibilities for the exploration of planets other than the Earth—the moon, Mars, and other parts of the solar system—became a reality. Thus the question of the possible existence of life elsewhere than on Earth conceivably could be answered.

Physical Constants of Hydrocarbon and Non-hydrocarbon Compounds National Academies Press

Vanadium is one of the more abundant elements in the Earth's crust and exhibits a wide range of oxidation states in its compounds making it potentially a more sustainable and more economical choice as a catalyst than the noble metals. A wide variety of reactions have been found to be catalysed by homogeneous, supported and heterogeneous vanadium complexes and the number of applications is growing fast. Bringing together the research on the catalytic uses of this element into one essential resource, including theoretical perspectives on proposed mechanisms for vanadium catalysis and an overview of its relevance in biological processes, this book is a useful reference for industrial and academic chemists alike.

The Systematic Identification of Organic Compounds Thermophysical Properties of

Chemicals and Hydrocarbons

Diluted bitumen has been transported by pipeline in the United States for more than 40 years, with the amount increasing recently as a result of improved extraction technologies and resulting increases in production and exportation of Canadian diluted bitumen. The increased importation of Canadian diluted bitumen to the United States has strained the existing pipeline capacity and contributed to the expansion of pipeline mileage over the past 5 years. Although rising North American crude oil production has resulted in greater transport of crude oil by rail or tanker, oil pipelines continue to deliver the vast majority of crude oil supplies to U.S. refineries. *Spills of Diluted Bitumen from Pipelines* examines the current state of knowledge and identifies the relevant properties and characteristics of the transport, fate, and effects of diluted bitumen and commonly transported crude oils when spilled in the environment. This report assesses whether the differences between properties of diluted bitumen and those of other commonly transported crude oils warrant modifications to the regulations governing spill response plans and cleanup. Given the nature of pipeline operations, response planning, and the oil industry, the recommendations outlined in this study are broadly applicable to other modes of transportation as well.

Basic Principles of Organic Chemistry Fire Engineering Books

Includes activities of BP in Alaska and northern Canada.

A Handbook Dealing with the Organisation and Functions of an Integrated International Oil Company, with Particular Reference to the British Petroleum Company Limited Royal Society of Chemistry

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Polycyclic Aromatic Hydrocarbons Modern Chemistry

The letter symbols for the concepts most widely used in chemical engineering are listed on the following pages.

Handbook of Hydrocarbon and Lipid Microbiology John Wiley & Sons

Presenting a clear, understandable examination, this book outlines efficient, effective methods and strategies for the complex field of subsurface remediation. The editors fully assess the state-of-knowledge of subsurface science requisite for finding new solutions, providing a focused guide for advanced subsurface remediation technology. Unparalleled in scope and practicality, *Subsurface Restoration* assists those persons determining the extent of environmental contamination for remedial technology selection and for environmental decision-making at all levels.

14th International Conference, PCT 2020, Perm, Russia, May 27 – 29, 2020, Revised Selected Papers National Academies Press
Introduction what is organic chemistry all about?; Structural organic chemistry the shapes of molecules functional groups; Organic nomenclature; Alkanes; Stereoisomerism of organic molecules; Bonding in organic molecules atomic-orbital models; More on nomenclature compounds other than hydrocarbons; Nucleophilic substitution and elimination reactions; Separation and purification identification of organic compounds by spectroscopic techniques; Alkenes and alkynes. Ionic and radical addition reactions; Alkenes and alkynes; Oxidation and reduction reactions; Acidity or alkynes. *Our Industry, Petroleum* John Wiley & Sons

A decade ago, the U.S. chemical industry was in decline. Of the more than 40 chemical manufacturing plants being built worldwide in the mid-2000s with more than \$1 billion in capitalization, none were under construction in the United States. Today, as a result of abundant domestic supplies of affordable natural gas and natural gas liquids resulting from the dramatic rise in shale gas production, the U.S. chemical industry has gone from the world's highest-cost producer in 2005 to among the lowest-cost producers today.

The low cost and increased supply of natural gas and natural gas liquids provides an opportunity to discover and develop new catalysts and processes to enable the direct conversion of natural gas and natural gas liquids into value-added chemicals with a lower carbon footprint. The economic implications of developing advanced technologies to utilize and process natural gas and natural gas liquids for chemical production could be significant, as commodity, intermediate, and fine chemicals represent a higher-economic-value use of shale gas compared with its use as a fuel. To better understand the opportunities for catalysis research in an era of shifting feedstocks for chemical production and to identify the gaps in the current research portfolio, the National Academies of Sciences, Engineering, and Medicine conducted an interactive, multidisciplinary workshop in March 2016. The goal of this workshop was to identify advances in catalysis that can enable the United States to fully realize the potential of the shale gas revolution for the U.S. chemical industry and, as a result, to help target the efforts of U.S. researchers and funding agencies on those areas of science and technology development that are most critical to achieving these advances. This publication summarizes the presentations and discussions from the workshop. *Handbook of Petroleum Refining* John Wiley & Sons

The introduction of carbon-fluorine bonds into organic compounds can profoundly influence their chemical and physical properties when compared to their non-fluorine-containing analogues, leading to a range of man-made materials with highly desirable properties. These molecules are of interest across the wide spectrum of industrial and academic organic chemistry, from pharmaceuticals, through fine and specialty chemicals to polymers. From Prozac to Teflon, many of the most important products of the chemical and life-science industries rely on organic fluorine chemistry for their useful properties. This book covers both the preparative methodologies and chemical properties of partially and highly fluorinated organic systems.

Volume 1 National Academies Press
Distinguished by its superior allied health focus and integration of technology, Seager and Slabaugh's *CHEMISTRY FOR TODAY: GENERAL, ORGANIC, and BIOCHEMISTRY*, Fifth Edition continues to lead the market on both fronts through numerous allied health-related applications, examples, boxes, and a new Companion Web Site, *GOB ChemistryNow*(tm). In addition to the many resources found in *GOB ChemistryNow*, this powerful new Web site contains questions modeled after the "Nursing School and Allied Health Entrance Exams" and NCLEX-LPN "Certification Exams." The

authors strive to dispel users' inherent fear of chemistry and to instill an appreciation for the role chemistry plays in our daily lives through a rich pedagogical structure and an accessible writing style that provides lucid explanations. In addition, Seager and Slabaugh's **CHEMISTRY FOR TODAY**, Fifth Edition, provides greater support in both problem-solving and critical-thinking skills. By demonstrating how this information will be important to a reader's future career and providing important career information online, the authors not only help readers to set goals but also to focus on achieving them.