

Petroleum Refinery Process Economics Paperback 2000 Author Robert E Maples

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Fundamentals of Petroleum Refining - Mohamed A. Fahim 2009-11-19

Fundamentals of Petroleum Refining presents the fundamentals of thermodynamics and kinetics, and it explains the scientific background essential for understanding refinery operations. The text also provides a detailed introduction to refinery engineering topics, ranging from the basic principles and unit operations to overall refinery economics. The book covers important topics, such as clean fuels, gasification, biofuels, and environmental impact of refining, which are not commonly discussed in most refinery textbooks. Throughout the source, problem sets and examples are given to help the reader practice and apply the fundamental principles of refining. Chapters 1-10 can be used as core materials for teaching undergraduate courses. The first two chapters present an introduction to the petroleum refining industry and then focus on feedstocks and products. Thermophysical properties of crude oils and petroleum fractions, including processes of atmospheric and vacuum distillations, are discussed in Chapters 3 and 4. Conversion processes, product blending, and alkylation are covered in chapters 5-10. The remaining chapters discuss hydrogen production, clean fuel production, refining economics and safety, acid gas treatment and removal, and methods for environmental and effluent treatments. This source can serve both professionals and students (on undergraduate and graduate levels) of Chemical and Petroleum Engineering, Chemistry, and Chemical Technology. Beginners in the engineering field, specifically in the oil and gas industry, may also find this book invaluable. Provides balanced coverage of fundamental and operational topics Includes spreadsheets and process simulators for showing trends and simulation case studies Relates processing to planning and management to give an integrated picture of refining

[Nafta](#) - 2005

The American Economic Review - 1920

Includes papers and proceedings of the annual meeting of the American Economic Association. Covers all areas of economic research.

[OPEC Bulletin](#) - Organization of Petroleum Exporting Countries 1994

Features news from Member Countries, incisive forum articles, a review of the oil market, and topical issues.

History, Exploration & Exploitation of Oil and Gas - Silvia Fernanda Figueirôa 2019-04-02

This edited volume discusses scientific and technological aspects of the history of the oil and gas industry in national and international contexts. The search for oil for industrial uses began in the nineteenth century, the first drills made in Azerbaijan and the United States. This intense search for a substance to become one of the most important energy sources was, many times, based on skill as well as luck, resulting in knowledge and the development of prospecting and exploration technologies. The demand for oil improved expertise in geological science, in areas such as micropaleontology, stratigraphy or sedimentology and informed different disciplines such as geophysics. These contributions made possible not only the discovery of new oil fields but also new applications and methods of exploration. Beyond the scientific and technological aspects, an industry that grew to such considerable size also impacted the political, economic, social, cultural, environmental and diplomatic issues in history. The book approaches these changes in different scales, countries, areas, and perspectives. This edited book appeals to researchers, student, practitioners in various fields from geology and geophysics to history. It is also an important resource for professionals in the oil and gas industry.

The Birth of Big Business in the United States, 1860-1914 - David O. Whitten 2006

Traces the economic, cultural, and historical roots of America's modern business enterprise in the years between the Civil War and World War I.

Economic and Political Weekly - 1984

[A Selected Bibliography on Alcohol Fuels](#) - 1982

Refinery Feedstocks - James G. Speight 2020-10-21

Over the last several decades, the petroleum industry has experienced significant changes in resource availability, petro-politics, and technological advancements dictated by the changing quality of refinery feedstocks. However, the dependence on fossil fuels as the primary energy source has remained unchanged. Refinery Feedstocks addresses the problems of changing feedstock availability and properties; the refining process; and solids deposition during refining. This book will take the reader through the various steps that are necessary for crude oil evaluation and refining including the potential for the use of coal liquids, shale oil, and non-fossil fuel materials (biomass) as refinery feedstocks. Other features: Describes the various types of crude oil and includes a discussion of extra heavy oil and tar sand bitumen Includes basic properties and specifications of crude oil and the significance in refinery operations This book is a handy reference for engineers, scientists, and students who want an update on crude oil refining and on the direction the industry must take to assure the refinability of various feedstocks and the efficiency of the refining processes in the next fifty years. Non-technical readers, with help from the extensive glossary, will also benefit from reading this book.

Petrochemicals in Nontechnical Language - Donald L. Burdick 2001

This authoritative text has been re-written and expanded to include additional chapters on methyl tertiary butyl ether and higher alcohols. Read it cover to cover, chapter by chapter as the subject comes up in your business, use it as an encyclopedia, or as a primer on petrochemical economics. Packed with diagrams and tables, it is the only source you will need to get a clear understanding of this complex topic. Each chapter includes exercises and 'in a nutshell' chapter reviews. Contents: What you need to know about organic chemistry Benzene Toluene and the xylenes Cyclohexane Olefins plants, ethylene, and propylene The hydrocarbon family Cumene and phenol Ethylbenzene and styrene Ethylene dichloride and vinyl chloride Propylene oxide and propylene glycol Methanol and synthesis gas Other alcohols Formaldehyde and acetaldehyde Ketones Acids Acrylonitrile, acrylic acid, and acrylates Maleic anhydride Alpha olefins Nature of polymers Thermoplastics Resins and fibers

[Petroleum Refining](#) - James H. Gary 2007-03-05

Petroleum refiners must face billion-dollar investments in equipment in order to meet ever-changing environmental requirements. Because the design and construction of new processing units entail several years' lead time, refiners are reluctant to commit these dollars for equipment that may no longer meet certain conditions when the units come on stream. Written by experts with both academic and professional experience in refinery operation, design, and evaluation, *Petroleum Refining Technology and Economics*, Fifth Edition is an essential textbook for students and a vital resource for engineers. This latest edition of a bestselling text provides updated data and addresses changes in refinery feedstock, product distribution,

and processing requirements resulting from federal and state legislation. Providing a detailed overview of today's integrated fuels refinery, the book discusses each major refining process as they relate to topics such as feedstock preparation, operating costs, catalysts, yields, finished product properties, and economics. It also contains end-of-chapter problems and an ongoing case study.

The World Book Encyclopedia - 2000

An encyclopedia designed especially to meet the needs of elementary, junior high, and senior high school students.

Petroleum Refinery Process Economics - Robert E. Maples 2000

Describes economic evaluations for both single processes and complete refineries, and illustrates how to use yield data, properties of products, and operating and capital costs in those evaluations. Two chapters on transportation fuels and environmental concerns have been added to the second edition. Annotation copyrighted by Book News, Inc., Portland, OR.

Western Oil and Refining - 1926

Membrane Engineering in the Circular Economy - Adolfo Iulianelli 2022-04-29

Membrane Engineering in the Circular Economy: Renewable Sources Valorization in Energy and Downstream Processing in Agro-food Industry describes the modification of the general concept of "waste," including waste valorization as added-value products that are useful for energy production and biotechnology industries. Speaking to the relevance of this new vision, the book highlights the fundamentals of membrane operations in the exploitation of renewable sources for energy production and the valorization of agro-food waste at the industrial level. This book is an excellent resource for researchers, biologists, membranologists and engineers in chemistry, biochemical engineering, food sciences and the agro-food refinery industry. Discusses membrane engineering for agro-food wastes' transformation into added-value products Presents circular and zero-waste economy principles pursued by membrane technology and applied to the agro-food industry Includes potentialities of agro-food wastes for renewable and energy production via membrane operations

Economically and Environmentally Sustainable Enhanced Oil Recovery - M. R. Islam 2020-03-17

There have been many books on the topic of Enhanced Oil Recovery (EOR) over the last 100 years. They all, however, focus on how to recover more oil faster, taking a rather myopic approach. The solutions presented all work fantastically in theory and even in the laboratory, but each fails to produce results in the field with long-term success. The petroleum industry is almost resigned to the belief that for an EOR technique to be successful, it must be propped up with public funds or must compromise environmental integrity. In line with modern engineering practices, previous books discuss how existing technologies can be tweaked to accommodate for any shortcomings that just came to light. This book is unlike any other book on the topic of recovery in particular and engineering in general. This groundbreaking volume is a continuation of the author's and his research group's work that started publishing on the subject of global sustainability involving energy and the environment, dating back to early 2000s. Starting with a paradigm shift in engineering that involves a long-term focus, rather than looking for short-term solutions, the methods and theories presented here delve into applying green engineering and zero waste principles to EOR. Historically, EOR has received mixed success, mainly because innovations in these disciplines relied heavily on processed materials, which are both uneconomical and toxic to the environment. This book explains how engineers missed entirely the causes of unsustainability in these technologies due to the prevalence of many myths that are embedded in modern engineering. Once these myths are deconstructed, the appropriate technologies emerge and the merits of them both in terms of economic and environmental benefits become clear. The book reveals how previous practices in EOR can be replaced with their sustainable versions while saving in material costs. A number of innovative technologies are introduced that can render well known technologies, such as steam flood, in situ combustion, chemical flooding, and microbial EOR environmentally sustainable and economically attractive. A triple dividend is received once these technologies are applied in otherwise marginal reservoirs, unconventional plays and even abandoned formations. The overall reserve, which reflects recoverable oil with new technologies, goes up drastically. Further benefits are drawn when processes such as value addition of waste material is performed. Overall this book shows how EOR can be

rendered green while increasing the profitability. This is in stark contrast to the past practices that considered environmental integrity as a drain on profitability. This book proves that a paradigm shift can turn a "technological disaster" into a technological marvel.

American Book Publishing Record - 2003

Australian Transport Literature Information System - 1982

Socioeconomic Impacts of Outer Continental Shelf Oil and Gas Development - Malka L. Pattison 1977

The Chemical Process Industries Infrastructure - James Riley Couper 2000-11-08

"Covers global and domestic competition, marketing strategies, operating expenses, and environmental and safety regulations for chemical professionals at all levels. Contains up-to-date mergers and acquisitions of chemical companies."

Chemical Engineering Design - Gavin Towler 2012-01-25

Chemical Engineering Design, Second Edition, deals with the application of chemical engineering principles to the design of chemical processes and equipment. Revised throughout, this edition has been specifically developed for the U.S. market. It provides the latest US codes and standards, including API, ASME and ISA design codes and ANSI standards. It contains new discussions of conceptual plant design, flowsheet development, and revamp design; extended coverage of capital cost estimation, process costing, and economics; and new chapters on equipment selection, reactor design, and solids handling processes. A rigorous pedagogy assists learning, with detailed worked examples, end of chapter exercises, plus supporting data, and Excel spreadsheet calculations, plus over 150 Patent References for downloading from the companion website. Extensive instructor resources, including 1170 lecture slides and a fully worked solutions manual are available to adopting instructors. This text is designed for chemical and biochemical engineering students (senior undergraduate year, plus appropriate for capstone design courses where taken, plus graduates) and lecturers/tutors, and professionals in industry (chemical process, biochemical, pharmaceutical, petrochemical sectors). New to this edition: Revised organization into Part I: Process Design, and Part II: Plant Design. The broad themes of Part I are flowsheet development, economic analysis, safety and environmental impact and optimization. Part II contains chapters on equipment design and selection that can be used as supplements to a lecture course or as essential references for students or practicing engineers working on design projects. New discussion of conceptual plant design, flowsheet development and revamp design Significantly increased coverage of capital cost estimation, process costing and economics New chapters on equipment selection, reactor design and solids handling processes New sections on fermentation, adsorption, membrane separations, ion exchange and chromatography Increased coverage of batch processing, food, pharmaceutical and biological processes All equipment chapters in Part II revised and updated with current information Updated throughout for latest US codes and standards, including API, ASME and ISA design codes and ANSI standards Additional worked examples and homework problems The most complete and up to date coverage of equipment selection 108 realistic commercial design projects from diverse industries A rigorous pedagogy assists learning, with detailed worked examples, end of chapter exercises, plus supporting data and Excel spreadsheet calculations plus over 150 Patent References, for downloading from the companion website Extensive instructor resources: 1170 lecture slides plus fully worked solutions manual available to adopting instructors

Knowledge Management for Competitive Advantage During Economic Crisis - Ordoñez de Pablos, Patricia 2014-09-30

Strategy management has always been a crucial business aspect that a company must understand to remain successful in the business world. However, there are a number of different approaches that a company can employ in order to differentiate themselves from the competition. Knowledge Management for Competitive Advantage During Economic Crisis brings together the various approaches that affect the superiority of a company's organizational performance and the gains they can make over their competitors. By focusing on concepts such as organizational learning and intellectual capital, this book is an indispensable reference source for researchers, practitioners, graduate students, and business managers interested in understanding

what approaches are necessary to ensure superior organizational performance.

Energy Saving and Carbon Reduction - Tony A. Chen 2022-11-27

The book provides an integrated energy/exergy analysis method to identify the energy utilization issues and systematically propose the cost-effective energy-saving and CO2 mitigation/capture solution. There is a strong market needs on energy-saving and greenhouse gas (GHG) reduction. CO2 mitigation/capture will achieve economic benefit of fuel, power, and carbon tax saving as well as environmental GHG reduction. The book is a professional book for energy-saving and GHG gas mitigation technology in oil & gas, oil refining, and chemical industry. It is an integrated technical book that combines energy utilization theory and practical method, including: thermodynamic analysis for unit operation and process units; energy and exergy calculation for various process streams and utilities; three-link energy/exergy analysis model; energy/exergy balance of equipment, process units, and entire plant; approach and technology of energy saving; optimization of pipeline and equipment; pinch energy-saving technology and its application; CO2 capture and utilization with 8 case studies incorporated for all different scenarios; key energy-saving technologies such gas turbine, FCCU regeneration CO combustion and energy recovery, flue gas turbine system optimization, low-grade heat recovery and utilization. The book is intended for engineers and professional personnel who are working in process engineering, EPC companies, chemical and petrochemical plants, refineries, oil & gas production facilities, power generation plant. It can also be a professional reference or textbook for undergraduate or graduate-level university students and teaching personnel of chemical, energy, and process engineering faculties of universities.

Ciottone's Disaster Medicine - E-Book - Gregory R. Ciottone 2023-03-07

While medical specialists in disaster mitigation, preparedness, and response are needed worldwide, the initial phase of disaster response is almost entirely dependent upon local resources—making it essential that all healthcare personnel have a working knowledge of the field and stand ready to integrate into the response system. Ciottone's Disaster Medicine, 3rd Edition, is the most comprehensive reference available to help accomplish these goals in every community. It thoroughly covers isolated domestic events as well as global disasters and humanitarian crises. Dr. Gregory Ciottone and more than 200 worldwide authorities share their knowledge and expertise on the preparation, assessment, and management of both natural and man-made disasters, including lessons learned by the responders to contemporary disasters such as the COVID-19 pandemic, Australian and western U.S. wildfires, European heatwaves, the Beirut explosion, recent hurricanes and typhoons, and the global refugee crisis. Part 1 offers an A-to-Z resource for every aspect of disaster medicine and management, while Part 2 features an exhaustive compilation of every conceivable disaster event, organized to facilitate quick reference in a real-time setting. Covers basic concepts such as identification of risks, organizational preparedness, equipment planning, disaster education and training, and more advanced concepts such as disaster risk reduction, health in complex emergencies, building local disaster resiliency, psychological impact of disasters on children, and more. Contains new decision trees throughout that help guide you through the decision-making process in difficult situations. Uses an easy-to-follow, templated approach to historical perspectives, overviews of current practice including pre-incident and post-incident actions, medical treatment of casualties, and potential pitfalls. Includes updated sections on man-made disasters, including mass casualties, active shooter situations, integrated response to terrorist attacks, and chemical/biological/radiological/nuclear/high-yield explosives disasters. Discusses the latest technologies, such as the use of mobile disaster applications, drone response systems, and virtual reality simulation training. Features thoroughly updated information on crisis leadership, practical applications of disaster epidemiology, disaster and climate change, and the integration of non-government agencies (NGOs) in disaster response—a critical topic for those responding to humanitarian needs overseas. Includes new chapters on Pandemic Preparedness and Response, Disaster Medicine in a Changing Climate, Disaster Response in Asia, Building Local Capacity and Disaster Resiliency, Civilian-Military Coordination in Disaster Response, Medical Simulation in Disaster Preparedness, Disaster Nursing, Crisis Meta-Leadership, Palliative Care in Disasters, Counter-Terrorism Medicine, SARS CoV (COVID-19 and SARS), and Disasters in Space Travel. An eBook version is included with purchase. The eBook allows you to access all of the text, figures and references, with the ability to search, customize your content, make notes and highlights, and have content read aloud.

U.S. Geological Survey Circular - 1933

Fossil Energy Update - 1984

Biorefinery - Juan-Rodrigo Bastidas-Oyanedel 2019-04-15

This book discusses the biorefinery of biomass feedstocks. In-depth chapters highlight the scientific and technical aspects and present a techno-economic analysis of such systems. By using a TEA approach, the authors present feasible pathways for conversion of biomass (both residual biomass, energy crops and algae biomass), showing the different possibilities for the production of biochemical materials, biofuels, and fertilizers. The concepts presented in this book will link companies, investors, and governments by providing a framework that will help reduce pollutants and create a biomass related economy that incorporates the newest developments and technologies in the area.

Processing of Heavy Crude Oils - Ramasamy Marappa Gounder 2019-12-18

Petroleum Review - 2007

Membrane Separation Processes - Ahmad Fauzi Ismail 2021-10-28

Membrane Separation Processes: Theories, Problems, and Solutions provides graduate and senior undergraduate students and membrane researchers in academia and industry with the fundamental knowledge on the topic by explaining the underlying theory that is indispensable for solving problems that occur in membrane separation processes. All major membrane processes are discussed, and an economic analysis is provided. Separation processes such as RO, UF, MF, RO, PRO and MD are thoroughly discussed. During the last two decades, the scope of the R&D of membrane separation processes has been significantly broadened. Other sections in the book cover membrane contactor and membrane adsorption. In addition, hybrid systems in which two or more membrane systems are combined are now being investigated for large-scale applications. Written by renowned experts with extensive experience with industry, education and R&D who have complementary expertise In-depth coverage of the most important conventional and emerging membrane processes Provides fundamental membrane theories for solving problems in separation processes without using complicated software

Petroleum Refining for the Non-technical Person - William L. Leffler 1985

Sets forth the many technical procedures involved in refining. Included are a new chapter on simple and complex refineries, and a revised chapter on gasoline blending, including current information on alcohol blending components.

Refining Processes Handbook - Surinder Parkash, Ph. D 2003-10-16

Besides covering topics like catalytic cracking, hydrocracking, and alkylation, this volume has chapters on waste water treatment and the economics of managing or commissioning the design of a petroleum refinery. Found only in this volume is material on operating a jointly owned and operated refinery. (Over the last decade, the ownership of many refineries has shifted to small companies, from the large, integrated companies. Because of this shift, many refineries are now jointly owned and operated.) Filled with handy process flow diagrams, this volume is the only reference that a chemical engineer or process manager in a petroleum refinery needs for answers to everyday process and operations questions. * Covers the technologies and operations of petroleum refineries * Provides material on operating a jointly owned and operated refinery * Gives readers a comprehensive introduction to petroleum refining, as well as a full reference to engineers in the field

Characterization and Properties of Petroleum Fractions - M. R. Riazi 2005

The last three chapters of this book deal with application of methods presented in previous chapters to estimate various thermodynamic, physical, and transport properties of petroleum fractions. In this chapter, various methods for prediction of physical and thermodynamic properties of pure hydrocarbons and their mixtures, petroleum fractions, crude oils, natural gases, and reservoir fluids are presented. As it was discussed in Chapters 5 and 6, properties of gases may be estimated more accurately than properties of liquids. Theoretical methods of Chapters 5 and 6 for estimation of thermophysical properties generally can

be applied to both liquids and gases; however, more accurate properties can be predicted through empirical correlations particularly developed for liquids. When these correlations are developed with some theoretical basis, they are more accurate and have wider range of applications. In this chapter some of these semitheoretical correlations are presented. Methods presented in Chapters 5 and 6 can be used to estimate properties such as density, enthalpy, heat capacity, heat of vaporization, and vapor pressure.

Characterization methods of Chapters 2-4 are used to determine the input parameters needed for various predictive methods. One important part of this chapter is prediction of vapor pressure that is needed for vapor-liquid equilibrium calculations of Chapter 9.

Oil Trade - 1926

Handbook of Petroleum Processing - Steven A. Treese 2015-08-04

This extensively updated second edition of the already valuable reference targets research chemists and engineers who have chosen a career in the complex and essential petroleum industry, as well as other professionals just entering the industry who seek a comprehensive and accessible resource on petroleum processing. The handbook describes and discusses the key components and processes that make up the petroleum refining industry. Beginning with the basics of crude oils and their nature, it continues with the commercial products derived from refining and with related issues concerning their environmental impact. More in depth coverage of many topics previously covered in the first edition, such as hydraulic fracturing or fracking as it is often termed, help ensure this reference remains a relevant and up-to-date resource. At its core is a complete overview of the processes that make up a modern refinery, plus a brief history of the development of processes. Also described in detail are design techniques, operations and in the case of catalytic units, the chemistry of the reaction routes. These discussions are supported by calculation procedures and examples, which enable readers to use today's simulation-software packages. The handbook also covers off-sites and utilities, as well as environmental and safety aspects relevant to the industry. The chapter on refinery planning covers both operational planning and the decision making procedures for new or revamped processes. Major equipment used in the industry is reviewed along with details and examples of the process specifications for each. An extensive glossary and dictionary of the terms and expressions used in petroleum refining, plus appendices supplying data such as converging factors and selected crude oil assays, as well as an example of optimizing a refinery configuration using linear programming are all included to aid the reader. The 2nd edition of the Handbook of Petroleum Processing is an indispensable desk reference for chemists and engineers as well as an essential part of the libraries of universities with a chemical engineering faculty and oil refineries and engineering firms performing support functions or construction.

Geological Survey Circular -

Engineering Economics and Economic Design for Process Engineers - Thane Brown 2016-04-19

Engineers often find themselves tasked with the difficult challenge of developing a design that is both technically and economically feasible. A sharply focused, how-to book, *Engineering Economics and Economic Design for Process Engineers* provides the tools and methods to resolve design and economic issues. It helps you integrate technical and economic decision making, creating more profit and growth for your organization. The book puts methods that are simple, fast, and inexpensive within easy reach. Author Thane

Brown sets the stage by explaining the engineer's role in the creation of economically feasible projects. He discusses the basic economics of projects — how they are funded, what kinds of investments they require, how revenues, expenses, profits, and risks are interrelated, and how cash flows into and out of a company. In the engineering economics section of the book, Brown covers topics such as present and future values, annuities, interest rates, inflation, and inflation indices. He details how to create order-of-magnitude and study grade estimates for the investments in a project and how to make study grade production cost estimates. Against this backdrop, Brown explores a unique scheme for producing an Economic Design. He demonstrates how using the Economic Design Model brings increased economic thinking and rigor into the early parts of design, the time in a project's life when its cost structure is being set and when the engineer's impact on profit is greatest. The model emphasizes three powerful new tools that help you create a comprehensive design option list. When the model is used early in a project, it can drastically lower both capital and production costs. The book's uniquely industrial focus presents topics as they would happen in a real work situation. It shows you how to combine technical and economic decision making to create economically optimum designs and increase your impact on profit and growth, and, therefore, your importance to your organization. Using these time-tested techniques, you can design processes that cost less to build and operate, and improve your company's profit.

Process Engineering Economics - Herbert English Schweyer 1955

Transitions to Alternative Vehicles and Fuels - National Research Council 2013-04-14

For a century, almost all light-duty vehicles (LDVs) have been powered by internal combustion engines operating on petroleum fuels. Energy security concerns about petroleum imports and the effect of greenhouse gas (GHG) emissions on global climate are driving interest in alternatives. *Transitions to Alternative Vehicles and Fuels* assesses the potential for reducing petroleum consumption and GHG emissions by 80 percent across the U.S. LDV fleet by 2050, relative to 2005. This report examines the current capability and estimated future performance and costs for each vehicle type and non-petroleum-based fuel technology as options that could significantly contribute to these goals. By analyzing scenarios that combine various fuel and vehicle pathways, the report also identifies barriers to implementation of these technologies and suggests policies to achieve the desired reductions. Several scenarios are promising, but strong, and effective policies such as research and development, subsidies, energy taxes, or regulations will be necessary to overcome barriers, such as cost and consumer choice.

Petroleum Refining: Crude oil, petroleum products, process flowsheets - Jean-Pierre Wauquier 1995

In this first volume, the reader will find, collected and condensed, the information needed to characterize, analyze, and evaluate crude oils from different origins and their corresponding petroleum cuts as well. The characteristics and specifications of all the petroleum products along with their simplified process flowsheets are reviewed. Contents: 1. Composition of crude oils and petroleum products. 2. Fractionation and elemental analysis of crude oils and petroleum cuts. 3. Characterization of crude oils and petroleum fractions. 4. Methods for the calculation of hydrocarbon physical properties. 5. Characteristics of petroleum products for energy use (motor fuels - heating fuels). 6. Characteristics of non-fuel petroleum products. 7. Standards and specifications of petroleum products. 8. Evaluation of crude oils. 9. Additives for motor fuels and lubricants. 10. Introduction to refining. Appendices: Principal characteristics of pure components. Principal standard test methods for petroleum products. References. Index.