

# Modern Petroleum Refining Process Bhaskara Rao

Petroleum Refining Processes Petroleum Refinery Process Economics Petroleum Refining: Crude oil, petroleum products, process flowsheets Practical Advances in Petroleum Processing Fundamentals of Petroleum Refining Petroleum Refinery Process Modeling Petroleum Refining Petroleum Refining Processes Refining Processes Handbook Handbook of Petroleum Refining Processes Handbook of Petroleum Refining Modern Petroleum Refining Processes, 5/E Petroleum Refining Design and Applications Handbook, Volume 1 Thermal and Catalytic Processes in Petroleum Refining Handbook of Petroleum Processing Petroleum Refining Petroleum Refining and Manufacturing Processes Modern Petroleum Refining Processes Handbook of Petroleum Refining Processes Petroleum Refining Design and Applications Handbook, Volume 5 James G. Speight Robert E. Maples Jean-Pierre Wauquier Chang Samuel Hsu Mohamed A. Fahim Y. A. Liu James H. Gary James G. Speight Surinder Parkash Ph. D Robert A. Meyers James G. Speight Rao A. Kayode Coker Serge Raseev David S. J. Jones Mark J. Kaiser Maxcine J. Japour Rao Robert Allen Meyers A. Kayode Coker

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this work highlights contemporary approaches to resource utilization and provides comprehensive coverage of technological advances in residuum conversion it illustrates state of the art engineering methods for the refinement of heavy oils bitumen and other high sulphur feedstocks

maples presents an organized look at yield data and properties of products from refinery processes how to use this information in performing various process economics studies and

discusses operating and capital costs for economic evaluation of both single processes and complete refineries yield correlations are presented for all of the important commercially established petroleum refinery processes each accompanied by operating requirements and capital cost of a typical unit here the user has all of the information required to perform a preliminary economic evaluation for each process yield correlation a simplified process flow diagram and brief process description is given contents correlation methodology crude oils hydrocarbons and refinery products refinery processing overview energy resources and transportation fuels the environment and the refinery crude oil and residual oil processing solvent deasphalting visbreaking and aquaconversion delayed coking fluid coking flexicoking heavy distillate processing fluid catalytic and heavy oil cracking hydrocracking hydrotreating light distillate processing naphtha desulfurization catalytic reforming light hydrocarbon processing isomerization alkylation catalytic polymerization and dehydration oxygenates treating and other auxiliary processes aromatics extraction hydrogen manufacture sour water stripping sweetening acid gas removal sulfur recovery tail gas cleanup water treatment and waste disposal blending process economics economics

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

includes topics not found together in books on petroleum processing economics automation process modeling online optimization safety environmental protection combines overviews of petroleum composition refinery processes process automation and environmental protection with comprehensive chapters on recent advances in hydroprocessing fcc lubricants hydrogen management gives diverse perspectives both geographic and topical because contributors include experts from eight different countries in north america europe and asia representing oil companies universities catalyst vendors process licensors consultants and engineering contractors

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

a comprehensive review of the theory and practice of the simulation and optimization of the petroleum refining processes petroleum refinery process modeling offers a thorough review of how to quantitatively model key refinery reaction and fractionation processes the text introduces the basics of dealing with the thermodynamics and physical property predictions of hydrocarbon components in the context of process modeling the authors three experts on the topic outline the procedures and include the key data required for building reaction and fractionation models with commercial software the text shows how to filter through the extensive data available at the refinery and using plant data to begin calibrating available models and extend the models to include key fractionation sub models it provides a sound and informed basis to understand and exploit plant phenomena to improve yield consistency and performance in addition the authors offer information on applying models in an overall refinery context through refinery planning based on linear programming this important resource offers the basic information of thermodynamics and physical property predictions of hydrocarbon components in the context of process modeling uses the key concepts of fractionation lumps and physical properties to develop detailed models and workflows for atmospheric cdu and vacuum vdu distillation units discusses modeling fcc catalytic reforming and hydroprocessing units written for chemical engineers process engineers and engineers for measurement and control this resource explores the advanced simulation tools and techniques that are available to support experienced and aid new operators and engineers

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

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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

offers detailed description of process chemistry and thermodynamics and product by product specifications of plants contributors are drawn from the largest petroleum producers in the world including chevron mobil shell exxon uop and texaco covers the very latest technologies in the field of petroleum refining processes completely updated 3rd edition features 50 all new material

petroleum refining involves refining crude petroleum as well as producing raw materials for the petrochemical industry this book covers current refinery processes and process types that are likely to come on stream during the next three to five decades the book includes 1 comparisons of conventional feedstocks with heavy oil tar sand bitumen and bio feedstocks 2 properties and refinability of the various feedstocks 3 thermal processes versus hydroprocesses and 4 the influence of refining on the environment

the availability and continuity of petroleum and natural gas have become an important parameter for the growth of economy of any country specially the scarcity of the precious stock is reflected in the growing economies our country being poor in these resources has to depend upon the ever increasing imports our crude production for decades together never

crossed 34 mmt thus by 2010 we may have to import 130 150 mmtpa though our refining capacity has gone up to 134 mmtpa with a present consumption of 110 mmtpa with new discoveries and over sea ventures by ongc and other oil producing organizations present production is better than what it was four decades ago the present fifth edition is a value added text and taken care of many aspects of modern refining and indian industry contents origin formation and composition of petroleum petroleum processing data fractionation of petroleum treatment techniques thermal and catalytical processes asphalt technology appendix 1 appendix 2 appendix 3 appendix 4 appendix 5 index

there is a renaissance that is occurring in chemical and process engineering and it is crucial for today s scientists engineers technicians and operators to stay current with so many changes over the last few decades in equipment and processes petroleum refining is almost a living document constantly needing updating with no new refineries being built companies are spending their capital re tooling and adding on to existing plants refineries are like small cities today as they grow bigger and bigger and more and more complex a huge percentage of a refinery can be changed literally from year to year to account for the type of crude being refined or to integrate new equipment or processes this book is the most up to date and comprehensive coverage of the most significant and recent changes to petroleum refining presenting the state of the art to the engineer scientist or student useful as a textbook this is also an excellent handy go to reference for the veteran engineer a volume no chemical or process engineering library should be without written by one of the world s foremost authorities this book sets the standard for the industry and is an integral part of the petroleum refining renaissance it is truly a must have for any practicing engineer or student in this area

this text examines the thermal and catalytic processes involved in the refining of petroleum including visbreaking coking pyrolysis catalytic cracking oligomerization alkylation hydrofining hydroisomerization hydrocracking and catalytic reforming it analyzes the thermodynamics reaction mechanisms and kinetics of each process as well as

this handbook describes and discusses the features that make up the petroleum refining industry it begins with a description of the crude oils and their nature it continues with the saleable products from the refining processes with a review of the modern day environmental impact there is a complete overview of the processes that make up the refinery with a brief history of the processes it also describes design technique operation and in the case of catalytic units the chemistry of the reaction routes these discussions are supported by calculation procedures and examples sufficient to enable good input to modern computer simulation packages the handbook also covers off sites and utilities as well as environmental and safety aspects relevant to the industry

for four decades petroleum refining has guided thousands of readers toward a reliable understanding of the field and through the years has become the standard text in many schools and universities around the world offering petroleum refining classes for self study

training and as a reference for industry professionals the sixth edition of this perennial bestseller continues in the tradition set by jim gary as the most modern and authoritative guide in the field updated and expanded to reflect new technologies methods and topics the book includes new discussion on the business and economics of refining cost estimation and complexity crude origins and properties fuel specifications and updates on technology process units and catalysts the first half of the book is written for a general audience to introduce the primary economic and market characteristics of the industry and to describe the inputs and outputs of refining most of this material is new to this edition and can be read independently or in parallel with the rest of the text in the second half of the book a technical review of the main process units of a refinery is provided beginning with distillation and covering each of the primary conversion and treatment processes much of this material was reorganized updated and rewritten with greater emphasis on reaction chemistry and the role of catalysis in applications petroleum refining technology economics and markets is a book written for users the practitioners of refining and all those who want to learn more about the field

offers detailed description of process chemistry and thermodynamics and product by product specifications of plants contributors are drawn from the largest petroleum producers in the world including chevron mobil shell exxon uop and texaco covers the very latest technologies in the field of petroleum refining processes completely updated 3rd edition features 50 all new material

petroleum refining with no new refineries having been built in decades companies continue to build onto or reverse engineer and re tool existing refineries with so many changes in the last few years alone books like this are very much in need there is truly a renaissance for chemical and process engineering going on right now across multiple industries this fifth and final volume in the petroleum refining design and applications handbook set this book continues the most up to date and comprehensive coverage of the most significant and recent changes to petroleum refining presenting the state of the art to the engineer scientist or student besides the list below this groundbreaking new volume describes blending of products from the refinery applying the ternary diagrams and classifications of crude oils flash point blending pour point blending aniline point blending smoke point and viscosity blending cetane and diesel indices the volume further reviews refinery operational cost cost allocation of actual usage project and economic evaluation involving cost estimation cash flow involving return on investment net present values discounted cash flow rate of return net present values payback period inflation and sensitivity analysis and so on it reviews global effects on the refining economy carbon tax carbon foot print global warming potential carbon dioxide equivalent carbon credit carbon offset carbon price and so on it reviews sustainability in petroleum refining and alternative fuels biofuels and so on impact of the overall greenhouse effects carbon capture and storage in refineries process intensification in biodiesel biofuel from green diesel acid gas removal and emerging technologies carbon capture and storage gas heated reformer unit pressure swing adsorption process steam

methane reforming for fuel cells grey blue and green hydrogen production new technologies for carbon capture and storage carbon clean process design refinery of the future refining and petrochemical industry characteristics the text is packed with excel spreadsheet calculations and honeywell unisim design software in some examples and it includes an invaluable glossary of petroleum and petrochemical technical terminologies useful as a textbook this is also an excellent handy go to reference for the veteran engineer a volume no chemical or process engineering library should be without written by one of the world's foremost authorities this book sets the standard for the industry and is an integral part of the petroleum refining renaissance it is truly a must have for any practicing engineer or student in this area

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