

# Fluid Catalytic Cracking Handbook

SECOND EDITION

Design, Operation  
and Troubleshooting  
of FCC Facilities



Reza Sadeghbeigi

**BALYAN**

# Fluid Catalytic Cracking Handbook Design Operation And Troubleshooting

**John J. McKetta Jr**



## **Fluid Catalytic Cracking Handbook Design Operation And Troubleshooting:**

*Fluid Catalytic Cracking Handbook* Reza Sadeghbeigi, 2020-04-17 *Fluid Catalytic Cracking Handbook* An Expert Guide to the Practical Operation Design and Optimization of FCC Units Fourth Edition enables readers to maximize the profitability and reliability of fluid catalytic cracking operations by covering all stages of FCC including their design operation troubleshooting and optimization It includes valuable chapters on FCC Main Fractionator and Gas Plant and Process Engineering Tools that provide engineers with the relevant tools they need to fully optimize processes and operations This book presents technologies and processes that will improve the profitability and reliability of FCC units along with lessons from Mr Sadeghbeigi's 30 years of field experience The book provides a valuable reference for experienced engineers but is also an ideal reference for those who are developing their skills and knowledge base Presents relevant real world examples that enable petrochemical engineers to achieve real term savings Contains dedicated chapters on lessons learned from troubleshooting cases carried out by the author Includes sections on FCC Main Fractionator and Gas Plant Covers both SI and Imperial Units throughout

*Fluid Catalytic Cracking Handbook* Reza Sadeghbeigi, 1995 This practical guide provides information on the design operation and troubleshooting of FCC facilities provides practical information covering all areas of fluid catalytic cracking *Oil Gas Journal*

*Fluid Catalytic Cracking Handbook* Reza Sadeghbeigi, 2000-06-08 This updated edition provides practical information on the design operation troubleshooting and optimization of fluid catalytic cracking facilities Covering the latest technologies to improve the profitability and reliability of the FCC units this edition provides several no to low cost practical recommendations A new chapter supplies valuable recommendations for debottlenecking and optimizing the performance of cat cracker operations

*Petroleum Refining Processes* James G. Speight, Baki Ozum, 2001-10-31 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

**Advances in Fluid Catalytic Cracking** Mario L. Occelli, 2010-11-30 Refiners efforts to conform to increasingly stringent laws and a preference for fuels derived from renewable sources have mandated changes in fluid cracking catalyst technology *Advances in Fluid Catalytic Cracking Testing Characterization and Environmental Regulations* explores recent advances and innovations in this important component of petr

*Petroleum Refining Design and Applications Handbook, Volume 1* A. Kayode Coker, 2018-09-05 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     The Refinery of the Future James G. Speight,2020-07-25 The Refinery of the Future Second Edition delivers useful knowledge that will help the engineer understand the processes involved feedstocks composition and future technologies Covering the basic chemistry commercial processes already in use and future innovation this reference gives engineers and managers the tools needed to understand refining products feedstocks and the processes critical to convert feedstocks to desired outcomes New information concerning tight shale formations and heavy oil process options is included for today s operations Rounding out with future uses in shale bioliquids and refinery configurations this book gives engineers and refinery managers the knowledge to update and upgrade their refinery assets Links basic petrochemical and refinery knowledge into application for today s oil and gas refining industry Gives insights into the development and applications of refining process technology along with the types of feedstock and their properties Updated with a focus on crude oils recovered from tight shale and sandstone formations along with increased emphasis on heavy oil and tar sand bitumen     Composite Materials for Industry, Electronics, and the Environment Omari V. Mukbaniani,Devrim Balköse,Heru Susanto,A. K. Haghi,2019-06-03 This new volume focuses on different aspects of composite systems that are associated with research and development helping to bridge the gap between classical analysis and modern real life applications The chapters look at the experimental and theoretical aspects of composite materials regarding preparation processing design properties and practical implications It also presents recent advancements research and development prospects of advanced composite materials that provide new solutions for advanced technologies     **Fouling in Refineries** James G. Speight,2015-05-14 Fouling in Refineries is an important and ongoing problem that directly affects energy efficiency resulting in increased costs production losses and even unit shutdown requiring costly expenditures to clean up equipment and return capacity to positive levels This text addresses this common challenge for the hydrocarbon processing community within each unit of the refinery As refineries today face a greater challenge of accepting harder to process heavier crudes and the ongoing flow of the lighter shale oil feedstocks resulting in bigger challenges to balance product stability within their process equipment this text seeks to inform all relative refinery personnel on how to monitor fouling characterize the deposits and follow all available treatments With basic modeling and chemistry of fouling and each unit covered users will learn how to operate at maximum production rates and elongate the efficiency of their refinery s capacity Presents an understanding of the breakdown of fouling per refinery unit including

distillation and coking units Provides all the factors crude types and refining blends that cause fouling especially the unconventional feedstocks and high acid crudes used today Helps users develop an analysis based treatment and control strategy that empowers them to operate refinery equipment at a level that prevents fouling from occurring **Handbook of Refinery Desulfurization** Nour Shafik El-Gendy, James G. Speight, 2015-09-18 Handbook of Refinery Desulfurization describes the operation of the various desulfurization process units in a petroleum refinery It also explains the processes that produce raw materials for the petrochemical industry It illustrates all the possible processes to lower the sulfur contents in petroleum and its fractions to decrease emissions of sulfur **Petroleum Processing Handbook** John J. McKetta Jr, 1992-04-30 A reference that details the pertinent chemical reactions and emphasizes the plant design and operations of petroleum processing procedures The handbook is divided into four sections products refining manufacturing processes and treating processes Wherever possible shortcut methods of calculation Catalysis for Clean Energy and Environmental Sustainability K. K. Pant, Sanjay Kumar Gupta, Ejaz Ahmad, 2021-04-01 This book is part of a two volume work that offers a unique blend of information on realistic evaluations of catalyst based synthesis processes using green chemistry principles and the environmental sustainability applications of such processes for biomass conversion refining and petrochemical production The volumes provide a comprehensive resource of state of the art technologies and green chemistry methodologies from researchers academics and chemical and manufacturing industrial scientists The work will be of interest to professors researchers and practitioners in clean energy catalysis green chemistry chemical engineering and manufacturing and environmental sustainability This volume focuses on catalyst synthesis and green chemistry applications for petrochemical and refining processes While most books on the subject focus on catalyst use for conventional crude fuel oriented refineries this book emphasizes recent transitions to petrochemical refineries with the goal of evaluating how green chemistry applications can produce clean energy through petrochemical industrial means The majority of the chapters are contributed by industrial researchers and technicians and address various petrochemical processes including hydrotreating hydrocracking flue gas treatment and isomerization catalysts **Handbook of Petroleum Refining** James G. Speight, 2016-10-26 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 **Encyclopedia of Renewable Energy, Sustainability and the Environment** , 2024-08-09 Encyclopedia of Renewable Energy Sustainability and the Environment Four Volume Set comprehensively covers all renewable energy resources including wind solar hydro biomass geothermal energy and nuclear power to name a few In addition to covering the breadth of renewable energy resources at a fundamental level this

encyclopedia delves into the utilization and ideal applications of each resource and assesses them from environmental economic and policy standpoints This book will serve as an ideal introduction to any renewable energy source for students while also allowing them to learn about a topic in more depth and explore related topics all in a single resource Instructors researchers and industry professionals will also benefit from this comprehensive reference Covers all renewable energy technologies in one comprehensive resource Details renewable energies processes from production to utilization in a single encyclopedia Organizes topics into concise consistently formatted chapters perfect for readers who are new to the field Assesses economic challenges faced to implement each type of renewable energy Addresses the challenges of replacing fossil fuels with renewables and covers the environmental impacts of each renewable energy      Prospects of Alternative Transportation Fuels Akhilendra P Singh, Rashmi Avinash Agarwal, Avinash Kumar Agarwal, Atul Dhar, Mritunjay Kumar Shukla, 2017-11-28 This book discusses different types of alternative fuels including biodiesel alcohol synthetic fuels compressed natural gas CNG and its blend with hydrogen HCNG and provides detailed information on the utilization of these alternative fuels in internal combustion IC engines Further it presents methods for production of these alternative fuels and explores advanced combustion techniques such as low temperature and dual fuel combustion using alternative fuels It includes a chapter on the soot morphology of biodiesel which focuses on the toxicity There are also four chapters on hydrogen fueled engines which discuss use of hydrogen in IC engines and also provide important information on the methodologies This book is a valuable resource for researchers and practicing engineers alike      The Desulfurization of Heavy Oils and Residua James G. Speight, 1999-11-05 Second Edition expands and updates information on the technological aspects of refining heavy oils residua bitumen and other high sulfur feedstocks Focuses on the range of next generation refining processes      *Petroleum Refinery Process Modeling* Y. A. Liu, Ai-Fu Chang, Kiran Pashikanti, 2018-06-05 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      **Thermal and Catalytic Processing in Petroleum Refining Operations** James G.

Speight,2023-04-11 This book presents the thermal and catalytic processes in refining The differences between each type of process and the types of feedstock that can be used for the processes are presented Relevant process data is provided and process operations are fully described This accessible guide is written for managers professionals and technicians as well as graduate students transitioning into the refining industry Key Features Describes feedstock evaluation and the effects of elemental chemical and fractional composition Details reactor types and bed types Explores the process options and parameters involved Assesses coke formation and additives Considers next generation processes and developments      **The**

**Chemistry and Technology of Petroleum** James G. Speight,2006-10-31 Refineries must not only adapt to evolving environmental regulations for cleaner product specifications and processing but also find ways to meet the increasing demand for petroleum products particularly for liquid fuels and petrochemical feedstocks The Chemistry and Technology of Petroleum Fourth Edition offers a 21st century perspective      Springer Handbook of Petroleum Technology Chang Samuel

Hsu,Paul R. Robinson,2017-12-20 This handbook provides a comprehensive but concise reference resource for the vast field of petroleum technology Built on the successful book Practical Advances in Petroleum Processing published in 2006 it has been extensively revised and expanded to include upstream technologies The book is divided into four parts The first part on petroleum characterization offers an in depth review of the chemical composition and physical properties of petroleum which determine the possible uses and the quality of the products The second part provides a brief overview of petroleum geology and upstream practices The third part exhaustively discusses established and emerging refining technologies from a practical perspective while the final part describes the production of various refining products including fuels and lubricants as well as petrochemicals such as olefins and polymers It also covers process automation and real time refinery wide process optimization Two key chapters provide an integrated view of petroleum technology including environmental and safety issues Written by international experts from academia industry and research institutions including integrated oil companies catalyst suppliers licensors and consultants it is an invaluable resource for researchers and graduate students as well as practitioners and professionals

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