

Alkylation Unit Corrosion And Fouling Dupont

This new Handbook provides a series of reference guides to cleaner production methods, technologies, and practices for key industry sectors. Each volume covers, for each industry sector: * the manufacturing technologies * waste management * pollution * methods for estimating and reporting emissions * treatment and control technologies * worker and community health risk exposures * cost data for pollution management * cleaner production and prevention alternatives Best Practices in The Petroleum Industry provides an overview of refineries and gas plant operations and identifies the key Environmental Aspects, supported by case studies of major incidents that resulted in catastrophic releases of oil and refined products, and a critical assessment of the methodology and calculation procedures that the industry relies on in preparing emissions inventories. The authors offer alternative approaches to providing more accurate emissions estimates, and guidelines on cleaner production and pollution prevention practices for improving overall environmental performance. Overview of the key Environmental Aspects of gas plant operations and refineries Case studies of major incidents that resulted in catastrophic releases of oil and refined products, including the Santa Barbara oil spill of 1969 and the EXXON Valdez incident Provides guidelines on cleaner production and pollution prevention practices for improving overall environmental performance

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

Corrosion Control in the Oil and Gas IndustryElsevier

The petroleum and chemical industries contain a wide variety of corrosive environments, many of which are unique to

these industries. Oil and gas production operations consume a tremendous amount of iron and steel pipe, tubing, pumps, valves, and sucker rods. Metallic corrosion is costly. However, the cost of corrosion is not just financial. Beyond the huge direct outlay of funds to repair or replace corroded structures are the indirect costs – natural resources, potential hazards, and lost opportunity. Wasting natural resources is a direct contradiction to the growing need for sustainable development. By selecting the correct material and applying proper corrosion protection methods, these costs can be reduced, or even eliminated. This book provides a minimum design requirement for consideration when designing systems in order to prevent or control corrosion damage safely and economically, and addresses:

- Corrosion problems in petroleum and chemical industries
- Requirements for corrosion control
- Chemical control of corrosive environments
- Corrosion inhibitors in refineries and petrochemical plants
- Materials selection and service life of materials
- Surface preparation, protection and maintainability
- Corrosion monitoring - plant inspection techniques and laboratory corrosion testing techniques

Intended for engineers and industry personnel working in the petroleum and chemical industries, this book is also a valuable resource for research and development teams, safety engineers, corrosion specialists and researchers in chemical engineering, engineering and materials science.

Process equipment and piping in chemical and petrochemical plants and petroleum refineries have to be cleaned periodically as part of normal maintenance operations to remove fouling that interferes with process flow, heat transfer, or other operations. Cleaning is also necessary to allow safe personnel entry prior to equipment inspection, repairs, or modifications. Most cleaning operations are expensive and time-consuming and need to be planned, budgeted, and carried out in a timely fashion to ensure minimum interference with normal process or maintenance operations. Certain process equipment and piping may also have to be cleaned prior to being put into service for the first time. Such pre-commission cleaning removes rust, dirt, and other debris that formed or entered during fabrication, shipment, or erection, and that are likely to cause damage after start-up. process equipment and piping in chemical plants, petrochemical plants and petroleum refineries. Practical information and guidance is provided for plant engineers and operators who, from time to time, are charged with planning various cleaning operations that will be carried out either by in-house maintenance personnel or outside cleaning contractors. Sufficient information is given to enable the nonspecialist to either propose cleaning procedures or evaluate cleaning procedures proposed by others. The manual enumerates a multitude of factors that need to be considered before a cleaning operation is started, including timing, alternative methods, costs, manpower requirements, safety concerns, and waste disposal issues.

According to NACE (National Association of Corrosion Engineers), the total annual cost of corrosion in petroleum refining takes up \$3.7 billion in the US alone. Corrosion control is always a challenge for the downstream industry, but as the quality of feedstock is

declining due to refineries accepting more of the heavy and shale gas and oil resources that are more readily available today, refinery managers, petroleum and natural gas engineers are unprepared for the new set of corrosion problems that are showing up in their equipment and processing units. Oil and Gas Corrosion Prevention: From Surface Facilities to Refineries quickly gets the engineer and manager up to speed on the latest types of corrosion common for these lower grade crude oils and gases as well as the best prevention methods for all of the major sections of the refinery, especially desalting and sulfur recovery units, which are the most common problem areas for unconventional feedstocks. Also covering the unique midstream sections, or point of entry to the refinery, as well as the major critical refinery equipment, Oil and Gas Corrosion Prevention: From Surface Facilities to Refineries offers the perfect quick cross-reference for the oil and gas community. Gets engineers and managers up to speed on the latest types of corrosion common for lower grade crude oils and gases Provides the best prevention methods for all of the major sections of the refinery, especially desalting and sulfur recovery units Covers additional topics such as unique midstream sections, or point of entry to the refinery, as well as major critical refinery equipment

Developed through an extensive process of consultation with leading professionals and health and safety institutions worldwide, the new, expanded, and long-awaited Fourth Edition of this well-respected reference provides comprehensive, timely, and accurate coverage of occupational health and safety. Aimed at the specialist and non-specialist alike, such as lawyers, doctors, nurses, engineers, toxicologists, regulators, and other safety professionals, this compendium is organized and designed to provide the most critical information in an easy-to-read format. It uses more than 1,000 illustrations, a new attractive layout, and provides thousands of cited references that provide up-to-date literature reviews. Indexes by subject, chemical name, and author make navigating through information quick and easy. The CD-ROM version includes the same information as the print volumes, plus the benefit of a powerful search and retrieval engine to make searching for information as easy as a mouse click. Here's a sampling of what's covered in each volume and the CD-ROM: Volume 1: The body, health care, management and policy, tools and approaches Volume 2: Psychological and organizational factors, hazards, the environment, accidents, and safety Volume 3: Chemicals, industries and occupations Volume 4: Index by subject, chemical name, author, cross-reference guide, directory of contributors.

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, and continues with the saleable products from the refining processes, with a review of the environmental impact. There is a complete overview of the processes that make up the refinery with a brief history of those 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 input to modern computer simulation packages.

Understanding Process Equipment for Operators and Engineers explains how process equipment functions. As problems often arise in plants that must be solved by unit engineers, this book offers successful solutions and methods for their implementation.

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The concepts explained are based on Norm Lieberman's personal, hands-on experience. Like you, Norm attended a university and was exposed to technical seminars which did not always provide the needed solutions. In this text, you will learn the functioning of a variety of equipment types, including Fired Heater Draft, Centrifugal Pump Head, Distillation Tray Efficiency, Vacuum Jets, Recip Compressors, Steam Turbines, Thermosyphon Circulation Reboilers and Air Cooler. Includes methods and procedures on how to make field measurements Outlines fire heater principles and operation and how they develop draft Describes distillation column operation and methods to increase their efficiency Includes computer modeling and provides use case examples

This handbook is an in-depth guide to the practical aspects of materials and corrosion engineering in the energy and chemical industries. The book covers materials, corrosion, welding, heat treatment, coating, test and inspection, and mechanical design and integrity. A central focus is placed on industrial requirements, including codes, standards, regulations, and specifications that practicing material and corrosion engineers and technicians face in all roles and in all areas of responsibility. The comprehensive resource provides expert guidance on general corrosion mechanisms and recommends materials for the control and prevention of corrosion damage, and offers readers industry-tested best practices, rationales, and case studies.

Advances in Catalysis

Provides comprehensive coverage of corrosion inhibitors in the oil and gas industries Considering the high importance of corrosion inhibitor development for the oil and gas sectors, this book provides a thorough overview of the most recent advancements in this field. It systematically addresses corrosion inhibitors for various applications in the oil and gas value chain, as well as the fundamentals of corrosion inhibition and interference of inhibitors with co-additives. Corrosion Inhibitors in the Oil and Gas Industries is presented in three parts. The first part on Fundamentals and Approaches focuses on principles and processes in the oil and gas industry, the types of corrosion encountered and their control methods, environmental factors affecting inhibition, material selection strategies, and economic aspects of corrosion. The second part on Choice of Inhibitors examines corrosion inhibitors for acidizing processes, inhibitors for sweet and sour corrosion, inhibitors in refinery operations, high-temperature corrosion inhibitors, inhibitors for challenging corrosive environments, inhibitors for microbiologically influenced corrosion, polymeric inhibitors, vapor phase inhibitors, and smart controlled release inhibitor systems. The last part on Interaction with Co-additives looks at industrial co-additives and their interference with corrosion inhibitors such as antiscalants, hydrate inhibitors, and sulfide scavengers. -Presents a well-structured and systematic overview of the fundamentals and factors affecting corrosion -Acts as a handy reference tool for scientists and engineers working with corrosion inhibitors for the oil and gas industries -Collectively presents all the information available on the development and application of corrosion inhibitors for the oil and gas industries -Offers a unique and specific focus on the oil and gas industries Corrosion Inhibitors in the Oil and Gas Industries is an excellent

resource for scientists in industry as well as in academia working in the field of corrosion protection for the oil and gas sectors, and will appeal to materials scientists, electrochemists, chemists, and chemical engineers.

With production from unconventional rigs continuing to escalate and refineries grappling with the challenges of shale and heavier oil feedstocks, petroleum engineers and refinery managers must ensure that equipment used with today's crude oil is protected from fouling deposits. Crude Oil Fouling addresses this overarching challenge for the petroleum community with clear explanations on what causes fouling, current models and new approaches to evaluate and study the formation of deposits, and how today's models could be applied from lab experiment to onsite field usability for not just the refinery, but for the rig, platform, or pipeline. Crude Oil Fouling is a must-have reference for every petroleum engineer's library that gives the basic framework needed to analyze, model, and integrate the best fouling strategies and operations for crude oil systems. Defines the most critical variables and events that cause fouling Explains the consequences of fouling and its impact on operations, safety, and economics Provides the technical models available to better predict and eliminate the potential for fouling in any crude system

Corrosion in ageing refinery plant presents a serious safety hazard. This important book summarises key research into corrosion processes in refinery equipment, how it can be measured and controlled. The book reviews factors affecting corrosion such as carburisation and metal dusting as well as corrosion in steel and other materials used in refinery technology. It considers corrosion in a range of refinery equipment such as storage tanks, HF alkylation units, sour water strippers and insulated units. Other chapters discuss ways of testing for corrosion and cracking in refineries together with integrity and life cycle assessment techniques. There is also coverage of ways of trouble-shooting corrosion problems and preventative measures such as coating systems. With its distinguished editor and team of contributors, Corrosion in refineries is a valuable reference for all those concerned with building and maintaining refineries in the petrochemical industry. Summarises key research into corrosion processes in refinery equipment Discusses ways of testing for corrosion and cracking in refineries

This book is targeted to benefit the diploma in engineering students. Degree in engineering students (B.Tech-Chemical Engineering, Petroleum Engineering, Petrochemical Engineering, Aeronautical Engg., AMIE, AMIICHE, students etc. M. Tech students of various disciplines pursuing courses on petroleum refining. Faculty members/ teaching staff of engineering college/IIT's/NIT's etc. Practicing petroleum engineers/consultants/refiners in various private sector/public sector undertakings, state/central government departments, NGO's etc. Students of foreign universities of developing countries pursuing diploma/degree/postgraduate courses in various engineering disciplines having a paper in petroleum refinery engineering.?

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Drawing on his passion, training, and experience, Lieberman presents problems and troubleshooting techniques that are associated with specific processes, systems, and equipment, leading novice and practiced troubleshooters alike to the crux of malfunctions and failures. The fourth edition updates troubleshooting and design techniques, and adds seven new chapters with information on turbines, motors, heat exchangers, and environmentally friendly operations. Norm Lieberman sprinkles his troubleshooting guide with insightful and humorous anecdotes from 45 years in the petrochemical and refining industry. Features: * Nitty-gritty descriptions of common refinery and chemical plant problems and the diagnostic field observations, experiments, and calculations that reveal their origin * Troubleshooting checklists and references following each chapter * Practical advice for optimizing interactions with key plant operations personnel

The effect of corrosion in the oil industry leads to the failure of parts. This failure results in shutting down the plant to clean the facility. The annual cost of corrosion to the oil and gas industry in the United States alone is estimated at \$27 billion (According to NACE International)—leading some to estimate the global annual cost to the oil and gas industry as exceeding \$60 billion. In addition, corrosion commonly causes serious environmental problems, such as spills and releases. An essential resource for all those who are involved in the corrosion management of oil and gas infrastructure, *Corrosion Control in the Oil and Gas Industry* provides engineers and designers with the tools and methods to design and implement comprehensive corrosion-management programs for oil and gas infrastructures. The book addresses all segments of the industry, including production, transmission, storage, refining and distribution. Selects cost-effective methods to control corrosion Quantitatively measures and estimates corrosion rates Treats oil and gas infrastructures as systems in order to avoid the impacts that changes to one segment if a corrosion management program may have on others Provides a gateway to more than 1,000 industry best practices and international standards

This thoroughly updated edition of *Fluid Catalytic Cracking Handbook* provides practical information on the design, operation, troubleshooting, and optimization of fluid catalytic cracking (FCC) facilities. Based on the author's years of field experience, this expanded, second edition covers the latest technologies to improve the profitability and reliability of the FCC units, and provides several "no-to-low-cost" practical recommendations. A new chapter supplies valuable recommendations for debottlenecking and optimizing the performance of cat cracker operations.

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

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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 must-read for any practicing engineer or student in this area 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. This book offers 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.

THE FIRST BOOK OF ITS KIND ON DISTILLATION TECHNOLOGY The last half-century of research on distillation has tremendously improved our understanding and design of industrial distillation equipment and systems. High-speed computers have taken over the design, control, and operation of towers. Invention and innovation in tower internals have greatly enhanced tower capacity and efficiency. With all these advances, one would expect the failure rate in distillation towers to be on the decline. In fact, the opposite is the case: the tower failure rate is on the rise and accelerating. Distillation Troubleshooting collects invaluable hands-on experiences acquired in dealing with distillation and absorption malfunctions, making them readily accessible for those engaged in solving today's problems and avoiding tomorrow's. The first book of its kind on the distillation industry, the practical lessons it offers are a must for those seeking the elusive path to trouble-free distillation. Distillation Troubleshooting covers over 1,200 case histories of problems, diagnoses, solutions, and key lessons. Coverage includes: * Successful and unsuccessful struggles with plugging, fouling, and coking * Histories and prevention of tray, packing, and internals damage * Lessons taught by incidents and accidents during shutdowns, commissioning, and abnormal operation * Troubleshooting distillation simulations to match the real world * Making packing liquid distributors work * Plant bottlenecks from intermediate draws, chimney trays, and feed points * Histories of and key lessons from explosions and fires in distillation towers * Prevention of flaws that impair reboiler and condenser performance * Destabilization of tower control systems and how to correct it * Discoveries from shutdown inspections * Suppression of foam and accumulation incidents A unique resource for improving the foremost industrial separation process, Distillation Troubleshooting transforms decades of hands-on experiences into a handy reference for professionals and students involved in the operation, design, study, improvement, and management of large-scale distillation.

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