Chapter One Kfupm

Since 1987, the Petroleum Division of the American Chemical Society (ACS) has sponsored at 3 year intervals an international symposium on fluid cracking catalysts (FCC) technology. This volume collects the recent progress of this technology as reported in the papers presented during the 232th National Meeting of the ACS in San Francisco, September 10-14, 2006. Sixty-six years after the introduction of the fluid cracking catalyst process, it remains the main process of gasoline generation for the estimated 237 millions cars on US roads. Catalysts testing and evaluation still remains a subject of interest, debate and controversy. Lambda sweep testing, testing of SOx, NOx and combustion promoters have been discussed in details together with catalyst evaluation for atmospheric residues and metal contaminated oils cracking. Of particular interest has been the introduction of novel concept in process design aimed at improving cracked product selectivity such as two-stage risers for better gasoline and olefins production and downer technology for high severity processes . The importance of solid state nuclear magnetic resonance (NMR) in the study of crude oils, catalysts and reaction products are illustrated by several examples. Two contributions describe the use of predictive methods to understand FCC aging and deactivation and personal overviews of the development of SOx and combustion promoters technology are presented. * Presents findings from the tri-annual international symposium on fluid cracking catalysts (FCC) technology, sponsored by the Petroleum Division of the American Chemical Society (ACS) * Two contributions describe the use of predictive methods to understand FCC aging and deactivation * Personal overviews by the authors of the development of SOx and combustion promoters technology

Issues in Systems Engineering / 2013 Edition is a ScholarlyEditions™ book that delivers timely, authoritative, and comprehensive information about Systems and Control Engineering. The editors have built Issues in Systems Engineering: 2013 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Systems and Control Engineering in this book to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Systems Engineering: 2013 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at http://www.ScholarlyEditions.com/.

Petroleum and natural gas still remain the single biggest resource for energy on earth. Even as alternative and renewable sources are developed, petroleum and natural gas continue to be, by far, the most used and, if engineered properly, the most cost-effective and efficient, source of energy on the planet. Drilling engineering is one of the most important links in the energy chain, being, after all, the science of getting the resources out of the ground for processing. Without drilling engineering, there would be no gasoline, jet fuel, and the myriad of other "have to have" products that people use all over the world every day. Following up on their previous books, also available from Wiley-Scrivener, the authors, two of the most well-respected, prolific, and progressive drilling engineers in the industry, offer this groundbreaking volume. They cover the basics tenets of drilling engineering, the most common problems that the drilling engineer faces day to day, and cutting-edge new technology and processes through their unique lens. Written to reflect the new, changing world that we live in, this fascinating new volume offers a treasure of knowledge for the veteran engineer, new hire, or student. This book is an excellent resource for

petroleum engineering students, reservoir engineers, supervisors & managers, researchers and environmental engineers for planning every aspect of rig operations in the most sustainable, environmentally responsible manner, using the most up-to-date technological advancements in equipment and processes.

This revised, updated and expanded new edition presents an overview of biomimetics and biologically inspired structured surfaces. It deals with various examples of biomimetics which include surfaces with roughness-induced superomniphobicity, self-cleaning, antifouling, and controlled adhesion. The focus in the book is on the Lotus Effect, Salvinia Effect, Rose Petal Effect, Oleophobic/philic Surfaces, Shark Skin Effect, and Gecko Adhesion. This new edition also contains new chapters on the butterfly wing effect, bio- and inorganic fouling and structure and Properties of Nacre and structural coloration.

Self-Cleaning of Surfaces and Water Droplet Mobility deals with the self-cleaning of hydrophobic surfaces. Chapters cover the basics of wetting states of fluids and surface characteristics in terms of texture topology and free energy. The self-cleaning aspects of surfaces, such as various synthesizing and fabrication processes are then introduced and discussed, along with environmental dust properties, including elemental compositions, particle sizes and shapes, and their chemo-mechanics characteristics. In addition, mud formation in humid air, as well as ambient and dry mud adhesion on optically transparent surfaces is explored, as is water droplet dynamics on hydrophilic and hydrophobic surfaces, amongst other topics. The book fills the gap between the physical fundamentals of surface energy and texture characteristics for practical applications of surface cleaning and provides a basic understanding of the self-cleaning of surfaces that will be idea for academics, researchers and students. Showcases the fundamental aspects of the self-cleaning of surfaces Includes practical applications in energy and other sectors Contains a review of the characterization of environmental dust on hydrophilic and hydrophobic surfaces Discusses the fabrication and optimization of surfaces towards self-cleaning Presents practical applications of the self-cleaning of surfaces via water droplet mobility

The serious challenge facing the world today, in obtaining enough energy for growing population and in controlling the carbon emission caused by fossil fuel use, calls for nuclear energy as an alternative power source. This book presents research work and technical experience from several power plants and research institutions around the world from practical prospective. This book intends to provide useful information for scientists and those in technical fields in several areas in nuclear power plants including: nuclear systems protection, design and modelling of critical parameters in nuclear power plants, thermalhydraulic analysis, nuclear waste management and safety and reliability assessment.

"This book highlights the efforts and developments in the fields of Asian studies as well as its intentional role in IT and management within the constant growing business market"--Provided by publisher.

Optimization in Quality Control presents a broad survey of the state of the art in optimization in quality, and focuses on industrial and national competitiveness. Each chapter has been carefully developed and refereed anonymously by experts in the area of optimization in quality control. Some of the topics covered in this volume include: fundamentals of optimization techniques contemporary approaches to optimization models in process control economic design of control charts determining optimal target values in multiple criteria economic selection models examining quality improvement schemes by trading off between expected warranty servicing costs and increasing manufacturing costs designing optimal inspection plans. This book will serve as an important reference source for academics, professionals and researchers.

This book provides a comprehensive overview of the structural, nanotribological and nanomechanical properties of skin with and without

cream treatment as a function of operating environment. The biophysics of skin as the outer layer covering human or animal body is discussed as a complex biological structure. Skin cream is used to improve skin health and create a smooth, soft, and flexible surface with moist perception by altering the surface roughness, friction, adhesion, elastic modulus, and surface charge of the skin surface.

Aluminium alloys have undergone a dramatic transformation in areas of extrusion, machining, welding, heat treatment, structural changes, created by ultra fine particles and enhanced corrosion resistance. Hence, these alloys have made rapid gains in European automotive and space industry. These developments have been described by experts in the book with new data and attractive graphics. The effect of processing parameters, including welding and deep rolling on their performance have been highlighted to alleviate the concerns of manufacturers and designers for new applications. The novel role of aluminum alloys in photovoltaic cells and concentrated solar power has been comprehensively described in the context of corrosion and the aggressive environment to which they may be exposed. The book is designed to serve as a guide for future innovations and new developments in aluminium alloys.

The International Federation of Library Associations and Institutions (IFLA) is the leading international body representing the interests of library and information services and their users. It is the global voice of the information profession. The series IFLA Publications deals with many of the means through which libraries, information centres, and information professionals worldwide can formulate their goals, exert their influence as a group, protect their interests, and find solutions to global problems.

Just before the end of the 1990-1991 Gulf War, more than 700 wells in Kuwaiti oil fields were set on fire. Several international companies and scientific organisations were involved in extinguishing the fires and in assessing the impact of this major environmental incursion. Kuwaiti Oil Fires: Regional Environmental Perspectives summarises these effects. The topics covered include the application of remote sensing techniques to determine the location of wells on fire and plume movement; air quality and particulate monitoring by ground stations and aircraft measurements; organic and inorganic constituents in the air; use of modeling techniques to study dispersion characteristics of pollutants and deposition of soot; and the efforts by the fire fighters in extinguishing fires and capping the wells. A brief overview of the causes of the crisis and the role of regional and international groups in resolving the dispute is presented as well as some basic and useful statistics of the region covering general information on economic aspects and exploitation of oil resources in both Iraq and Kuwait. Problems faced by the fire fighting teams, the preparations made to overcome the problems, and technology used in extinguishing the well fires are also discussed. Numerous colour photographs are used to illustrate the problems encountered and the techniques involved in their solution.

"This book presents in-depth insight through a case study approach into the current state of research in ICT as well as identified successful approaches, tools and methodologies in ICT research"--Provided by publisher.

Control Strategy for Time-Delay Systems Part I: Concepts and Theories covers all the important features of real-world practical applications which will be valuable to practicing engineers and specialists, especially given that delays are present in 99% of industrial processes. The book presents the views of the editors on promising research directions and future industrial applications in this area. Although the fundamentals of time-delay systems are discussed, the book focuses on the advanced modeling and control of such systems and will provide the analysis and test (or simulation) results of nearly every technique described. For this purpose, highly complex models are introduced to ?describe the mentioned new applications, which are characterized by ?time-varying delays with intermittent and stochastic nature, several types of nonlinearities, and the presence ?of different time-scales. Researchers, practitioners, and PhD students will gain insights into the prevailing trends in design and operation of real-time control systems, reviewing the shortcomings and future developments concerning

practical system issues, such as standardization, protection, and design. Presents an overview of the most recent trends for time-delay systems Covers the important features of the real-world practical applications that can be valuable to practicing engineers and specialists Provides analysis and simulations results of the techniques described in the book

This book provides a comprehensive overview of a series of bismuth oxyhalide compounds of BiOX (X=F, Cl, Br, I), in terms of their microstructure, electronic/band structure, preparation techniques, optical properties and their applications. The book brings together, for the first time, a compilation of advances in this area, including results achieved at the authors' lab (such as ultra-microscopy characterization by means of aberration-corrected STEM), offering a valuable guide for researchers and students alike.

In the recent decade a quantum leap has been made in production of aluminum alloys and new techniques of casting, forming, welding and surface modification have been evolved to improve the structural integrity of aluminum alloys. This book covers the essential need for the industrial and academic communities for update information. It would also be useful for entrepreneurs technocrats and all those interested in the production and the application of aluminum alloys and strategic structures. It would also help the instructors at senior and graduate level to support their text.

Based on remarkable primary research, this unique contemporary account of the lives of young Saudi men reveals a distinct group of voices.

The Global Innovation Index ranks the innovation performance of 141 countries and economies around the world, based on 84 indicators. This edition explores the impact of innovation-oriented policies on economic growth and development. High-income and developing countries alike are seeking innovation-driven growth through different strategies. Some countries are successfully improving their innovation capacity, while others still struggle.

In 1962 Rachel Carson warned of the consequences of man's pollution in her book Silent Spring, a book that some feel marks the real beginning of our environmental awareness. Silent Spring told of the consequences of our increasing pesticide use to birds. Almost 30 years after her warning, the western Arabian Gulf experienced its "silent spring" when approximately 100,000 to 250,000 waterbirds died, along with millions of other organisms, due to the massive oil spill that resulted due to Gulf war. The magnitude of our environmental problems has continued to grow during the last thirty years to a point where even the "doomsday" environmentalists could hardly have envisioned back in 1962. It seems the death of yet uncounted thousands of humans was not sufficient for Saddam Husain. His desire for power and infamy led him to unleash environmental war on mankind. At the end of the Gulf war he set ablaze the oil fields of Kuwait and released more oil into the sea than had been spilled at any time throughout history. These actions were despicable and an affront to civilized man. A quality environment should be a right of all mankind, and to wage war by deliberately polluting the earth cannot be tolerated.

This Guide to OCR for Arabic Scripts is the first book of its kind, specifically devoted to this emerging field. Topics and features: contains contributions from the leading researchers in the field; with a Foreword by Professor Bente Maegaard of the University of Copenhagen; presents a detailed overview of Arabic character recognition technology, covering a range of different aspects of pre-processing and feature extraction; reviews a broad selection of varying approaches, including HMM-based methods and a

recognition system based on multidimensional recurrent neural networks; examines the evaluation of Arabic script recognition systems, discussing data collection and annotation, benchmarking strategies, and handwriting recognition competitions; describes numerous applications of Arabic script recognition technology, from historical Arabic manuscripts to online Arabic recognition. Cloud Control Systems: Analysis, Design and Estimation introduces readers to the basic definitions and various new developments in the growing field of cloud control systems (CCS). The book begins with an overview of cloud control systems (CCS) fundamentals, which will help beginners to better understand the depth and scope of the field. It then discusses current techniques and developments in CCS, including event-triggered cloud control, predictive cloud control, fault-tolerant and diagnosis cloud control, cloud estimation methods, and secure control/estimation under cyberattacks. This book benefits all researchers including professors, postgraduate students and engineers who are interested in modern control theory, robust control, multi-agents control. Offers insights into the innovative application of cloud computing principles to control and automation systems Provides an overview of cloud control systems (CCS) fundamentals and introduces current techniques and developments in CCS Investigates distributed denial of service attacks, false data injection attacks, resilient design under cyberattacks, and safety assurance under stealthy cyberattacks

Microgrids: Advanced Control Methods and Renewable Energy System Integration demonstrates the state-of-art of methods and applications of microgrid control, with eleven concise and comprehensive chapters. The first three chapters provide an overview of the control methods of microgrid systems that is followed by a review of distributed control and management strategies for the next generation microgrids. Next, the book identifies future research directions and discusses the hierarchical power sharing control in DC Microgrids. Chapter 4 investigates the demand side management in microgrid control systems from various perspectives, followed by an outline of the operation and controls of the smart microgrids in Chapter 5. Chapter 6 deals with control of low-voltage microgrids with master/slave architecture. The final chapters explain the load-Frequency Controllers for Distributed Power System Generation Units and the issue of robust control design for VSIs, followed by a communication solution denoted as power talk. Finally, in Chapter 11, real-time implementation of distributed control for an autonomous microgrid system is performed. Addresses issues of contemporary interest to practitioners in the power engineering and management fields Focuses on the role of microgrids within the overall power system structure and attempts to clarify the main findings relating to primary and secondary control and management at the microgrid level Provides results from a quantified assessment of benefits from economic, environmental, operational, and social point-of-views Presents the hierarchical control levels manifested in microgrid operations and evaluates the principles and main functions of centralized and decentralized control

Progress in Partial Differential Equations is devoted to modern topics in the theory of partial differential equations. It consists of both original articles and survey papers covering a wide scope of research topics in partial differential equations and their applications. The contributors were participants of the 8th ISAAC congress in Moscow in 2011 or are members of the PDE interest group of the ISAAC society. This volume is addressed to graduate students at various levels as well as researchers in partial

differential equations and related fields. The readers will find this an excellent resource of both introductory and advanced material. The key topics are: • Linear hyperbolic equations and systems (scattering, symmetrisers) • Non-linear wave models (global existence, decay estimates, blow-up) • Evolution equations (control theory, well-posedness, smoothing) • Elliptic equations (uniqueness, non-uniqueness, positive solutions) • Special models from applications (Kirchhoff equation, Zakharov-Kuznetsov equation, thermoelasticity)

This short book is for students, professors and professionals interested in signal processing of seismic data using MATLABTM. The step-by-step demo of the full reflection seismic data processing workflow using a complete real seismic data set places itself as a very useful feature of the book. This is especially true when students are performing their projects, and when professors and researchers are testing their new developed algorithms in MATLABTM for processing seismic data. The book provides the basic seismic and signal processing theory required for each chapter and shows how to process the data from raw field records to a final image of the subsurface all using MATLABTM. The MATLABTM codes and seismic data can be downloaded here. Table of Contents: Seismic Data Processing: A Quick Overview / Examination of A Real Seismic Data Set / Quality Control of Real Seismic Data / Seismic Noise Attenuation / Seismic Deconvolution / Carrying the Processing Forward / Static Corrections / Seismic Migration / Concluding Remarks

Seismic Data Interpretation using Digital Image ProcessingJohn Wiley & Sons

This volume brings about the contemporary results in the field of discrete-time systems. It covers papers written on the topics of robust control, nonlinear systems and recent applications. Although the technical views are different, they all geared towards focusing on the up-to-date knowledge gain by the researchers and providing effective developments along the systems and control arena. Each topic has a detailed discussions and suggestions for future perusal by interested investigators.

The book includes an introduction to fuzzy logic and its application in the formulation of multi-objective optimization problems, a discussion on hybrid techniques that combine features of heuristics, a survey of recent research work, and examples that illustrate required mathematical concepts."--BOOK JACKET.

Nontraditional machining employs processes that remove material by various methods involving thermal, electrical, chemical and mechanical energy or even combinations of these. Nontraditional Machining Processes covers recent research and development in techniques and processes which focus on achieving high accuracies and good surface finishes, parts machined without burrs or residual stresses especially with materials that cannot be machined by conventional methods. With applications to the automotive, aircraft and mould and die industries, Nontraditional Machining Processes explores different aspects and processes through dedicated chapters. The seven chapters explore recent research into a range of topics including laser assisted manufacturing, abrasive water jet milling and hybrid processes. Students and researchers will find the practical examples and new processes useful for both reference and for developing further processes. Industry professionals and materials engineers will also find Nontraditional Machining Processes to be a source of ideas and processes for development and industrial application.

Problems after each chapter

Wireless communications has made a huge leap during the past two decades. The multiple-input-multiple-output (MIMO) technology was proposed in the 1990's as a viable solution that can overcome the data rate limit experienced by single-input-single-output (SISO) systems. This resource is focused on printed MIMO antenna system design. Printed antennas are widely used in mobile and handheld terminals due to their conformity with the device, low cost, good integration within the device elements and mechanical parts, as well as ease of fabrication. A perfect design companion for practicing engineers, this book provides full design examples from literature, along with detailed illustrations for the various antenna geometries. This resource overviews the various applications that currently depend on printed MIMO antennas, and provides design guidelines and remarks throughout the book for guidance.

Bridging the gap between modern image processing practices by the scientific community at large and the world of geology and reflection seismology This book covers the basics of seismic exploration, with a focus on image processing techniques as applied to seismic data. Discussions of theories, concepts, and algorithms are followed by synthetic and real data examples to provide the reader with a practical understanding of the image processing technique and to enable the reader to apply these techniques to seismic data. The book will also help readers interested in devising new algorithms, software and hardware for interpreting seismic data. Key Features: Provides an easy to understand overview of popular seismic processing and interpretation techniques from the point of view of a digital signal processor. Presents image processing concepts that may be readily applied directly to seismic data. Includes ready-to-run MATLAB algorithms for most of the techniques presented. The book includes essential research and teaching material for digital signal and image processing individuals interested in learning seismic data interpretation from the point of view of digital signal processing. It is an ideal resource for students, professors and working professionals who are interested in learning about the application of digital signal processing theory and algorithms to seismic data.

FPGA Prototyping Using Verilog Examples will provide you with a hands-on introduction to Verilog synthesis and FPGA programming through a "learn by doing" approach. By following the clear, easy-to-understand templates for code development and the numerous practical examples, you can quickly develop and simulate a sophisticated digital circuit, realize it on a prototyping device, and verify the operation of its physical implementation. This introductory text that will provide you with a solid foundation, instill confidence with rigorous examples for complex systems and prepare you for future development tasks.

This book provides a powerful source to develop new, rapid and highly efficient materials for the application in various fields of oil and gas. It focuses on the synthesis, characterization and applications of various Nanomaterials, presenting the state-of-the-art in developments and innovations in nanocomposites. This book provides the complete practical and theoretical information about the synthesis of nanoparticles with potential use in the field of oil and gas.

VLSI is an important area of electronic and computer engineering. However, there are few textbooks available for undergraduate/postgraduate study of VLSI design automation and chip layout. VLSI Physical Design Automation: Theory and Practice fills the void and is an essential introduction for senior undergraduates, postgraduates and anyone starting work in the field of CAD for VLSI. It covers all aspects of physical design, together with such related areas as automatic cell generation, silicon compilation, layout editors and compaction. A problem-solving approach is adopted and each solution is illustrated with examples. Each topic is treated in a standard format: Problem Definition, Cost Functions and Constraints, Possible Approaches and Latest

Developments. Special features: The book deals with all aspects of VLSI physical design, from partitioning and floorplanning to layout generation and silicon compilation; provides a comprehensive treatment of most of the popular algorithms; covers the latest developments and gives a bibliography for further research; offers numerous fully described examples, problems and programming exercises.

In this unique illustrated book, PhD students, postdoctoral researchers, senior visiting scholars, and staff describe their personal experiences in working with the late Prof. Ahmed H. Zewail at Caltech. Their reminiscences provide snapshots of their rich interactions, reflecting the great scientific achievements, as well as the human and humorous sides of Ahmed H. Zewail.The contributors tell us their stories covering a period of forty years, beginning from the time of Zewail's arrival at Caltech in 1976. Some of them cover the time when Zewail was starting his pioneering work on femtochemistry at the end of 80's, while others relate events long after he was awarded the Nobel Prize in Chemistry (1999) and had embarked on a new career in ultrafast electron imaging. The aims and scope of this book is to provide both scientists and non-scientists descriptions of the experiences of scientists in the early or mature stages of their careers when interacting with one of the greatest scientists of the 20th century, from developing the field of femtochemistry to pioneering ultrafast electron diffraction and imaging technology. The personal dimension of Zewail's leadership is reflected in all the contributions, and highlighted by special tributes from two of his children.The scientific and anecdotal stories recounted in the book give a rare view of experiences in shaping science. The reader will get firsthand accounts of how a Nobel Prize winner interacted daily with his co-workers to develop the laser-based science and technology for which he was internationally recognized. The recounted experiences may serve as a basis for scientists developing their own research, tutoring students, and supervising postdoctoral researchers.

"Covers recent advances in polymer degradation and stabilization. Focuses on the basics of photo- and bio-degradability. Delineates special and general environmental parameters such as solar irradiation, temperature, and agrochemical exposure. Surveys plastic waste disposal strategies such as recycling, incineration, chemical recovery by pyrolysis,

Web Text Introduction There is a general perception about the authors of autobiographies that they tell truth about other people while they need to tell truth about themselves. I have tried to be objective throughout my book and highlighted my failures and mistakes too. The present book is an account of my life that began on February 8, 1947, when I was born in the Sarpanch Mohammad Khurshid Haq family in a small town on the banks of the river Kanhan known as Kamptee in India. Sarpanch is a title used for the head of Panchayat. The title remained in our family for three generations. After my father died, Anis bhaijan (elder brother) would have become the next sarpanch, but he had already migrated to Pakistan in 1947 and later we all left. I take great pride to be part of the Khurshid family, which has its roots in Kamptee but now known internationally through the contributions of several family members not only in library and information science but also in physics, business administration, computer engineering, medicine, and biology. During my sixty-six years of life, I migrated or relocated to four different countries and benefitted from their rich cultures. When I look back into the history, I find the following four distinct periods, each representing the

years that I spent in one country before migration or relocation to another: 19471964, India 19641974, Pakistan 19742011, Saudi Arabia 2011present, United States The culture, social system, history, tradition, arts, language, literature, education system, and others will definitely influence anybody who has spent ten years or more in a country. Some may adopt a particular part of the local culture quickly, such as clothing, language, food, and so on. It is very common to see nurses from the Philippines learn Arabic in a few months and start talking to Saudi patients or visitors in Arabic with fluency because of the demand of their jobs. I feel sorry that I cannot speak Arabic as good as those Asian workers speak. However, their languages and scripts are completely different from Arabic. Now, one can understand that having lived in three countries for ten years or more, I have enriched my knowledge and skills, and enhanced other capabilities as information professional. I believe in the principle of give and take. I have benefitted from world knowledge all my life, now it is my turn to give something to the seekers of knowledge in return. Life is not about just take, take, and take; it is about both give and take. I find writing about myself as the most difficult job. During my professional career, I have worked with so many bosses, including deans, directors, and heads of departments. Before they left KFUPM or went back to their departments on the completion of their term, I requested recommendation letters from each one of them. Except my American bosses, all Saudi bosses asked me to first prepare a draft and show it to them so that they could make any changes, if needed. I had to be a little modest in preparing those drafts. I always felt that if the bosses had written those letters themselves, they would have used more superlatives for me. Therefore, I am already feeling a little uncomfortable writing my own biography. I will try to make this volume an objective and fair account of my personal and professional life. Family Roots in India Following the uprising of 1857, which the freedom fighters lost, the British forces started taking revenge against them and the local population civilians fearing for their lives started to move out. Among those who migrated in 1859 from Azam Garth and decided to settle down at Kamptee was the family of my pardada (great-grandfather) Mohammad Abdullah. He built ten mud houses and gave them free to the settlers until they found their own accommodation. Munshi Mohammed Saeed, my dada jan (grandfather), was born on April 30, 1875, in Kamptee. He is known more as a poet than for any other things. He used to publ