

**CAPABILITIES OF CHEMICAL ENGINEERING DEPARTMENT  
IN THE AREAS OF  
REFINING AND PETROCHEMICALS**

REFINING AND PETROCHEMICALS ARE THE HEART OF THE OIL INDUSTRY IN SAUDI ARABIA. THEREFORE, THEY ARE ONE OF THE AREAS OF FOCUS IN TEACHING AND RESEARCH IN THE CHE DEPARTMENT.

**FACULTY LIST IN REFINING AND PETROCHEMICALS**

<i>Name</i>	<i>Job Title</i>	<i>Specialization</i>
Dr. Sulaiman Al-Khattaf	Associate Professor	<i>Catalysis/Kinetics</i>
Dr. Ali G. Ma'adhah	Professor	Refining & Petrochemicals
Dr. Adnan M. Al-Amer	Professor	Petrochemicals
Dr. Muhammad Al-Saleh	Professor	Catalysis, Fuel Cells
Dr. Halim Hamid Redhwi	Professor	Refining, polymer degradation
Dr. Javaid Zaidi	Associate Professor	Catalysis, membrane separations, fuel cells
Dr. Ibnelwaleed Hussein	Associate Professor	Rheology, processing, Polyolefins, nanocomposites, flow in porous media
Dr. Basel Abu-Sharkh	Professor	Polymer Thermodynamics, Molecular modeling, drag reduction, Nanotechnology
Dr. Abdul Hadi	Assistant Professor	Polymer, Interface Science
Dr. Mohammed Al-Arfaj	Associate Professor	Process synthesis and Control
Dr. Ramazan Kahraman	Professor	Materials, Polymer Technology
Dr. Mamdouh Al-Harthy	Assistant professor	Polymer reaction engineering, mathematical modeling
Dr. Usamah Al-Mubayedh	Assistant Professor	Numerical Simulation, Viscoelasticity
Dr. Sleem-ur-Rahman	Associate Professor	Corrosion, Fuel Cells, Renewable Energies

## RESEARCH PROJECTS COMPLETED OR IN PROGRESS

No.	Project Title	Client
1.	Investigating Polymeric Entrainers for Azeotropic Distillation of MTBE/Methanol and Ethanol/Water Systems, 1997-1999	SABIC
2.	Synthesis and Commercial Application of Mesoporous Metallosilicates, 1997-2001	KFUPM
3.	A model for the optimum utilization of propane for the Saudi Petrochemical industry, 1999	British Council
4.	A model for the optimum planning of the Saudi Arabian petrochemical industry, 2000-2001	SABIC
5.	Catalytic Isomerization of Meta/Ortho-Xylenes to P-xylene in a Fluidized Bed Reactor, 2003-2005	KFUPM
6.	Catalytic disproportionation and transalkylation of Alkylbenzenes into p-xylene in a fluidized bed reactor, 2004-2007	KACST
7.	Reduction of supported NiO methanation and steam reforming catalysts	KACST
8.	Development and Application of State Estimators in Control of Reactive Distillation, 2004-2006	KFUPM
9.	Development of Customized Amine Process Simulation Model, 2004-2006.	Saudi Aramco
10.	Development of Methanol Extraction-Recovery System for TAME Reactive Distillation Process: design and Control, 2004-2005.	SABIC
11.	Development of solid-liquid mass transfer probe based on limiting diffusion current: Application in stirred tanks.	KFUPM
12.	How to reduce poisonous gases in battery room	STC
13.	Simulation of Plant Adsorber Operations Using a Cyclic ZLC Technique, 2003-2004	KFUPM
14.	Development of Highly Conductive Composite Membranes for Medium Temperature PEM Fuel Cell, 2005-2008	KFUPM
15.	Development of zeolite based polymer membranes for use in methanol, 1995-1997	Canada
16.	Methanol Permeation through PEMFC: Evaluation of Electrochemical Techniques, 2005- 2006	SABIC
17.	Separation of Binary Organic Mixtures using Novel Composite Polymeric Membranes by Pervaporation, 2006-2009	
18.	Synthesis, Thermal, and Rheological Characterization of Composite Membranes for Fuel Cell Applications, 2002–2003	KFUPM
19	Preparation, Characterization and Testing of Polypropylene-Palm Fiber Composites	KACST
20	Corrosion Protection of Steel by Catalyzed Polypyrrole Films	KFUPM
21	Water Absorption Behavior of Aluminum Powder Filled Epoxy Adhesive	KFUPM-SABIC
22	Effects of Moisture Sorption and the Filler Content on the Mechanical Performance of Metal Joints Bonded by Aluminum Filled Epoxy	KFUPM-SABIC
23	Water Adsorption Behavior of Palm/Polypropylene Composites	KFUPM-SABIC
24	A Study on Environmental Degradation of Aluminum Joints Bonded by Rubber-Modified and Aluminum-Filled Epoxy Adhesive	KFUPM-SABIC
25	Glass Transition Temperatures of Polymers with Strong Interactions from Molecular Dynamics Simulation	KFUPM

26	Influence of Polymer Structure on Protein partitioning in Two Phase Aqueous Polymer Solutions	KFUPM
27	Using Nonadditive Interaction to Investigate self Assembly in homo-polymers, copolymers, polymer solutions and stiff polymers: Molecular Dynamics Simulation, Phase Behavior and Equation of State	KFUPM
28	Influence of Hydrophobe Architecture on Self Assembly, Rheology and Interfacial Properties of Amphiphilic ionic Polymers	KFUPM
29	Glass Transition Temperatures of Strongly Interacting Polymers from Rigid Unit Molecular Dynamics Simulation	KFUPM-SABIC
30	Upgrading IbnZahr Analytical Laboratories	Ibn Zahr
31	Self assembly in confined semiflexible copolymers	KFUPM
32	Investigation of the Influence of Molecular Structure on Molecular Characteristics of metallocene LLDPE by NMR, Light Scattering, DSC, and MD Simulation Techniques	KACST
33	Synthesis, Thermal, and Rheological Characterization of Composite Membranes for Fuel Cell Applications	KFUPM
34	Investigation of Structure-Conformation Relationships in molten m-Polyethylenes by Rheological and Molecular Simulation Techniques	KFUPM-ARI
35	Influence of Molecular Parameters on the Rheology and Miscibility of molten linear low-density polyethylene (LLDPE) in low-density polyethylene (LDPE) and high-density polyethylene (HDPE).	KFUPM
36	A study to improve SABIC Polymers for the Performance Modification of Saudi-Asphalt	SABIC
37	Active Site Identification, Mathematical Modeling, Rheological, Thermal and Mechanical Properties of Controlled Microstructure Polyolefins made with Ziegler-Natta Catalysts	KACST
38	Influence of Tacticity and Mw on the Compatibility of PP/LDPE Blends: Rheological, Thermal, Mechanical, and Molecular Dynamics Simulation Study	KFUPM-SABIC
39	Development of Highly Conductive Composite Membranes for Medium Temperature PEM Fuel Cell	KFUPM
40	Sand Modification using Hydrobond Polymers	Bughshan Project # CEW 2288
41	A study to improve SABIC Polymers for the Performance Modification of Saudi-Asphalt	SABIC R&T
42	Active Site Identification, Mathematical Modeling, Rheological, Thermal and Mechanical Properties of Controlled Microstructure Polyolefins made with Ziegler-Natta Catalysts	KFUPM
43	Influence of Tacticity and Mw on the Compatibility of PP/LDPE Blends: Rheological, Thermal, Mechanical, and Molecular Dynamics Simulation Study	KFUPM
44	Development of Highly Conductive Composite Membranes for Medium Temperature PEM Fuel Cell	KFUPM

## SHORT COURSES

No.	Short Course Title
1.	Fundamentals of catalysis
2.	Membrane separation processes
3.	Introduction to Chemical Engineering For Non-Chemical Engineers
4.	Digital Process Control of Chemical Plants Analysis and Design
5.	Training programs for Sasref, Petrokemya, and Ibn Sina
6.	Plant Engineering for Saudi Aramco
7.	Introduction to petrochemical technology
8.	Polyolefin Reaction Engineering
9.	Polymer Rheology and Extrusion
10.	Polymer Characterization and Testing
11.	Rheology and Polymer Processing
12.	Polymer Engineering
13.	Membrane Technology

## INFRASTRUCTURE and RESOURCES

The department has two fully equipped labs in the areas of petrochemicals and polymer engineering.

### 1. Catalysis lab.

The lab is equipped with the following

- a. Fluidized bed reactor
- b. Fixed bed reactor
- c. GC

Carbon analyzer

- d. CSTR.

### 2. Polymer Research Laboratory

The research in polymers includes fundamental work on polymer/polymer miscibility by experimental and molecular simulation techniques, polyolefin blends, water soluble polymers and gels used in enhanced oil recovery applications, structure-property-processing relationships in polymers, composites including nanocomposites, mathematical modeling of polymerization processes, polymer modified asphalt, ..etc. The polymer lab is equipped with different rheological, thermal and characterization facilities that make it the best in the area. Recently, a twin screw extruder is added to our labs for polymer modifications and reactive extrusion experiments. Polymer research is supported by the CHE department, KFUPM, KACST. In addition, the polymer group did many

projects for industrial partners such as SABIC and ARAMCO. Further, the polymer research group made significant contributions in establishing three new centers of excellence in the areas of Refining and Petrochemicals, Renewable energies and Nanotechnology. Furthermore, the polymer group is currently collaboration with University of Waterloo, Canada; University of Minho, Portugal; Schulumberger. It should be noted that the University administration is very supportive to all requests for new equipments.

No.	Equipment
1.	ARES constant strain rheometer
2.	ACER high shear rheometer
3.	TA Q800 Dynamic Mechanical Analyzer
4.	TA Q1000 modulated DSC
5.	High temperature GPC
6.	Melt indexer
7.	Haake blender
8.	Wyatt static and dynamic light scattering instruments
9.	Instron mechanical testing instrument
10.	Carver press
11.	Injection molding machine
12.	Interfacial tension measurement devices
13.	Grinder
14.	Hydraulic cutter
15.	Twin Screw Extruder
16.	UV-Vis spectrometer and Fluorometer
17.	Various viscometers

## REFEREED JOURNAL PUBLICATIONS

1. Abul-Hamayel, M., M. A. Siddiqui, T. Ino, A. Aitani (2002). Experimental Determination of HS-FCC Deactivation Constant, *Applied Catalysis*, v. 237, p. 71.
2. Abul-Hamyel, A. Aitani, M. Saeed (2005). Enhancement of Propylene Production in a downer FCC operation using a ZSM-5 additive, *Chemical Engineering Technology*, v. 28, pp. 923-929.
3. Ahmed, S., A. Hassan, K. Alam, M. A. Al-Shalabi, and T. Inui (2002). Preparation and Characterization of Zeolite-based Hydrocracking Catalysts. *Pak Journal of Applied Sciences*, Vol. 2, No. 11, pp. 1034 – 1038.
4. Ahmed, S., S. A Ali, K Alam, SH Hamid, E Iwamatsu, E Hayashi, Y Sanada, and T Yoneda (1999). Characterization of Commercial Hydrocracking Catalysts by Temperature- Programmed Methods: TPR/TPS/TPD, *The Arabian Journal for Science and Engineering*, v. 24, 1c, 71-82.
5. Ahmed, S., S. A. Ali, H. Hamid, and K. Honna (2003). Preparation, Characterization, and Catalytic Evaluation of First Stage Hydrocracking Catalyst, *Studies in Surface Science and Catalysis*, v. 145, 295-298.
6. Aitani, A., F. Ali and H. Al-Ali (2000). A Review of Non-conventional Methods for the Desulfurization of Fuel Oil, *Petroleum Science & Technology*, 18, p. 537.

7. Aitani, A., T. Yoshikawa and T. Ino (2000). Maximization of FCC Light Olefins by High Severity Operation and ZSM-5 Addition, *Catalysis Today*, 60, p. 111.
8. Aitani, A., and SH Hamid (1996). Benzene Reduction in Reformate: A Review of Current Catalytic Studies," *The Arabian Journal of Science and Engineering*, 21(2), Theme Issue on Catalysis in Petroleum Refining, 181-192.
9. Ali, M., T. Kimura, Y. Suzuki, M. A. Al-Saleh, H. Hamid, and T. Inui (2002). Hydrogen Spillover Phenomenon in Noble Metal Modified Clay-Based Hydrocracking Catalysts, *Applied Catalysis A: General* 277 63-72.
10. Ali, S. A., M.E. Biswas, T. Yoneda, T. Muira, H. Hamid, E. Iwamatsu, H. Al-Suaibi (1999). A Novel Catalyst for Heavy Oil Hydrocracking, *Science and Technology of Catalysts*, vol. 68, pp. 407-410.
11. Al-Khattaf, S. (2002). The Influence of Y-Zeolite Unit Cell Size on the Performance of FCC Catalysts During Gas Oil Catalytic Cracking, *Applied Catalysis A*, v. 231, 1-2, pp.293-306.
12. Al-Khattaf, S., and de Lasa, H.I. (1999). Activity and Selectivity of FCC Catalysts Role of Zeolite Crystal Size", *Ind. Eng. Chem. Res.*, v. 38, p. 1350
13. Al-Khattaf, S., and de Lasa, H.I (2001). Catalytic Cracking of Alkyl-Benzene in a Novel CREC Riser Simulator-Effects of Y-Zeolite Crystal Size, In: *Fluid Catalytic Cracking V, Studies in Surface Science and Catalysis*, Edited by M.L. Occelli and P.O. O'Connor (Elsevier), v. 134, pp.279-292.
14. Al-Khattaf, S., and de Lasa, H.I. (2001). Catalytic Cracking of Cumene in a Riser Simulator, A catalyst activity decay model, *Ind. Eng. Chem. Res.*, 40, pp.5398-5404.
15. Al-Khattaf, S., and de Lasa, H.I. (2001). Diffusion and Reactivity of Hydrocarbons in FCC Catalysts, *Can. J. Chem.* 3, 79, p.341.
16. Al-Khattaf, S., and de Lasa, H.I. (2002). The Role of Diffusion in Alkyl-benzene Catalytic Cracking, *Applied Catalysis A*, 226, pp.139-153.
17. Al-Khattaf, S., Atias, A, Jarosch, K and de Lasa, H.I. (2002). Diffusion and Catalytic Cracking of 1,3,5 Tri-Iso-Propyl-benzen in FCC Catalysts, *Chemical Engineering Science*, 57, p.4909 (2002)
18. Al-Khattaf, S. (2003). The Influence of Alumina on the Performance of FCC Catalysts During Hydrotreated VGO Catalytic Cracking, *Energy & Fuels*, 17, pp.62-68.
19. Anabtawi, J., A.M. Al-Zahrani, S. A. Ali and M.A.B. Siddiqui (1997). Evaluation of Naphtha
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21. Choudhury, M.B.I., S. Ahmed, M.A. Shalabi, and T. Inui (2006). Preferential methanation of CO in a syngas involving CO<sub>2</sub> at lower temperature range. *Applied Catalysis A: General*, Vol. 314, pp. 47-53.
22. Gultekin, S., S. A. Ali and M.A. Al-Saleh (1985). Effects of Hydrogen Sulfide, Ammonia and Water on Catalytic Hydrogenation of Propylbenzene, *Arabian J. of Sci. and Engg.*, 10 (2), pp.159-171.
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24. Hamid, H. and M.A. Ali (1996). A comparative study of solvent for the extraction of aromatics for naphtha," *Energy Sources*, 18(1), 65-84.
25. Hamid, H. and MA Ali (1995). Effect of MTBE Blending on the Properties of Gasoline, *Fuel Science & Technology International*, 13(5), 509-606.
26. Hamid, H. (2000). Development of High-Performance Heavy Oil Hydrocracking Catalysts: Characterization of Atmospheric Residue Feed, *Petroleum Science and Technology*, 18 (7 & 8), 871-888.
27. Hasan, A., S. Ahmed, M.A. Ali, S.H.Hamid, and T. Inui (2001). A comparison Between  $\beta$  - and USY – Zeolite – based Hydrocracking Catalysts, *Applied Catalysis A: General*, 6784, 1-10.
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31. Hayashi, E., E. Iwamatsu, M.E. Biswas, Y. Sanada, S. Ahmad, S.H. Hamid, and T. Yoneda (1999). Characterization of High Surface Area Smectite Supported Cobalt Oxides Catalysts for Hydrodesulfurization by Means of TPR, TPS, and ESR, *Applied Catalysis A: General*, 179, 203-216.
32. Hayashi, E., E. Iwamatsu, M.E. Biswas, S.A. Ali, Y. Yamamoto, Y. Sanada, A.K.K. Lee, H. Hamid, and T. Yoneda (1997). High Surface Area Smectite Supported Cobalt Oxides as Active Catalysts for Thiophene Hydrodesulfurization, *Chemistry Letters*, 5, 433-434.
33. Hayashi, E., E. Iwamatsu, S. Ahmad, A. Lee, S.H. Hamid (1998). Characterization of CoMo-Al<sub>2</sub>O<sub>3</sub> Catalyst by a Combination Technique of TPS and ESR, *Journal of The Japan Petroleum Institute*, 41(3), 222-226.
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36. Ino, T., and Al-Khattaf, S. (1996). Effect of Unit Cell Size on the Activity and Coke Selectivity of FCC Catalysts, *Applied Catalysis A*, 142, pp.5-17, (1996)
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## **SHORT RESUMES**

### **DR. SULAIMAN S. AL-KHATTAF**

Dr. Al-Khattaf is the Director, Center of Refining & Petrochemicals (CRP) in the Research Institute of KFUPM and an Associate Professor of Chemical Engineering at King Fahd University of Petroleum & Minerals. He received his B.S. from KFUPM in Chemical Engineering in 1992. He worked as a chemical engineer at CRP, RI-KFUPM from 1992 to 1996. He received his MS in 1995 from the Chemical Engineering Department at KFUPM. He visited Nippon Oil Company, Japan as a visiting engineer from July 1994 to December 1994. He received his PhD in 2001 from Western Ontario University, Ontario, Canada. His M.S. and Ph.D. studies were in catalysis and catalytic processes; he particularly investigated the effect of diffusion and unit cell size on the performance of FCC catalysts. Dr. Al-Khattaf rejoined KFUPM on April 2001 as an Assistant Professor in the Department of Chemical Engineering. Here, he taught several courses, and is coordinating short courses in Utilities for Saudi Aramco. Recently Dr. Al-Khattaf has coordinated and taught a short course in FCC (Fluid Catalytic Cracking) which was delivered to the Saudi refining industries (mainly Saudi Aramco engineers). This course received the best short course award in the College of Engineering at KFUPM. He is also pursuing research in the area of diffusion and catalysis. He has more than 23 refereed journal and ten conference publications. Dr. Al-Khattaf is the principal investigator of different research projects.

### **DR. ADNAN M. AL-AMER**

Dr. Al-Amer is the Chairman and a Professor of the Department of Chemical Engineering at KFUPM. He received his PhD degree in Chemical Engineering from the University of British Columbia, Canada, in 1983. He has over 30 years of experience in teaching and research and technical consulting. He has taught various courses in the Department of Chemical Engineering at KFUPM since 1976. These include mass and energy balances, heat transfer, thermodynamics, process dynamics and control, petrochemical industries, computer applications in chemical engineering, and engineering economics and design principles. He also supervised projects of senior and coop students and graduate student's theses. Dr. Al-Amer's major research interests are in the areas of catalysis, and petrochemicals techno economics. He worked as manager of the Petroleum Refining and Petrochemicals Section of the Research Institute at KFUPM for more than five years (1988-1993). He supervised or participated in several research projects. These include; kinetics of MTBE synthesis and technology assessment, impact of lead phase out on the environment, feasibility studies on down stream petrochemical opportunities, modeling the development of the Saudi petrochemical industry, studies on weathering of plastics, pilot plant testing of naphtha hydrotreating catalysts, methanol conversion to light olefins, comprehensive technical review of the dimerization and oligomerization of ethylene to alpha olefins, direct conversion of paraffins to petrochemicals, isomerization of xylenes, and toluene and trimethyl benzene disproportionation and transalkylation to xylenes. He provides consultations to the local industry on various problems and projects. He has over fifty publications in refereed journals and conferences as well as a good number of technical reports.

### **DR. IBNELWALEED A. HUSSEIN**

Dr. Ibnelwaleed Ali Hussein is an Associate Professor in the Department of Chemical Engineering at KFUPM. Dr. Hussein obtained his PhD from the Chemical and Materials Engineering Department at University of Alberta, Canada in 1999. His PhD Thesis won the Canadian Society of Rheology Graduate Student Award for the year 1999. He joined KFUPM in January 2000. Through his academic life, Dr. Hussein received many Awards, Scholarships, Prizes and Nominations from University of Khartoum, Sudan; University of Alberta, Canada and KFUPM. His work experience include four years in the oil industry in Sudan; two years (1992-94) at KFUPM as a lecturer, and about one year at University of Alberta as postdoctoral fellow. He also taught at Northern Alberta Institute of Technology in Canada on part-time basis. Dr. Hussein received KFUPM "Distinguished Research Award" for the year 2005. The Chemical Engineering Department has awarded Dr. Hussein the "Faculty Service Award" for three years (2000/2001; 2001/2002; 2005/2006). Dr. Hussein taught different polymer, rheology and transport phenomena courses. Dr. Hussein is actively engaged in reach with more than 70 refereed journal articles and conference presentations and co-authored a book chapter. His research interest include: polymer rheology, processing, nanocomposites, viscoelastic surfactants and flow in porous media.

### **DR. BASEL ABU-SHARKH**

Dr. Basel Abu-Sharkh is a Professor in the Department of Chemical Engineering at KFUPM. Dr. Abu-Sharkh obtained his PhD from the Chemical Engineering Department at University of Wisconsin-Madison, USA in 1995. He joined KFUPM in January 1996. Through his academic life, Dr. Abu-Sharkh received many Awards, Scholarships, Prizes and Nominations. Dr. Abu-Sharkh is actively involved in research with more than 90 refereed journal and conference publications. His interests are in the areas of water soluble polymers synthesis and characterization, modeling and simulation. He has special interest in polyelectrolytes and gels. Currently, Dr. Abu-Sharkh is the principal investigator or co-investigator of many research projects of more than SR 5 million budget. His projects are funded by KFUPM; King Abdul Aziz City for Science and Technology as well as SABIC and Schlumberger. He supervised/co-supervised 12 MS and PhD students and is currently supervising four MS and PhD students. KFUPM, college of engineering and the Chemical Engineering Department awarded Dr. Abu-Sharkh the "excellence in research award", "Faculty Service Award", college service award and teaching.

### **DR. ALI G. MA'ADHAH**

Dr. Ma'adhah is a Professor in the Department of Chemical Engineering. He obtained his Ph.D in Chemical Engineering in 1978 from Oklahoma State University, Stillwater, USA. His areas of specialization include petroleum refining, petrochemicals, natural gas sweetening, and catalytic technology for upgrading heavy oil. He successfully completed working as a team member and project manager in many projects. He is a member, Board of Directors, Eastern Petrochemicals Company (1981-86). He has worked as a consultant to KACST National Petrochemicals Committee (1985-1995) and SABIC Technical Consultant (1979-85). He has co-edited the following two books □ Handbook of Polymer Degradation, Marcel Dekker, New York, 1992; Thermoplastics Beyond the Year 2000, KFUPM Press, 1996. He has published 23 journal articles. He served as the Editor for Chemical Engineering, Arabian Journal for Science and Engineering (AJSE), 1979 -2004. He was the Lead Editor of five AJSE theme issues.

### **DR. HALIM HAMID REDHWI**

Dr. Redhwi is the Assistant Supervisor for Dhahran techno-Valley and also a Professor in the Chemical Engineering Department, King Fahd University of Petroleum & Minerals (KFUPM). His educational background is in the areas of Chemical Engineering and Polymers. He received his Ph.D. from The City University, London in 1988. During his professional career spanning more than twenty-five years, he has been active in research and teaching in the field of Petroleum Refining, Petrochemicals, and Polymer Degradation. Dr. Redhwi's main contribution is in the establishment of research programs that became the areas of excellence for KFUPM. These programs are in the areas of Heavy Oil Upgrading, novel petroleum refining process and Polymer Degradation. The projects resulting from these programs generated multi million US \$ funding for KFUPM from industrial clients, such as, Saudi Aramco, SABIC, Nippon oil, Japan, Ciba Specialty Chemicals, Switzerland, etc. Dr. Redhwi's specific contribution was in the in the field of Heavy Oil Upgrading in an international project jointly conducted by the Japan Petroleum Energy Center (JPEC) and KFUPM since 1995. The project resulted in patent on catalyst system that can be commercialized. At present he is involved in an international project by Japan Cooperation Center of Petroleum (JCCP) and KFUPM in the field of developing a novel process for FCC. The pilot plant studies (0.1 barrels per day) of this project ended with promising results that led to the demonstration plant studies (30 barrels per day) in a local Saudi refinery's premises. The ultimate goal is to have a novel FCC process to be used commercially in the refineries worldwide. He has done some pioneering work in the area of UV induced degradation of polymers in harsh climates. The United Nations Environment Program (UNEP) has awarded him letter of appreciation and a citation of excellence for his work in ozone depletion and the effect of increased UV radiation on polymers. Dr. Redhwi has also established a long-term joint project with Ciba Specialty Chemicals, Switzerland since 2002. He was the recipient of the 1992-93 KFUPM-RI Distinguished Researcher Award. Dr. Redhwi has one patent from Japan and published more than 100 papers in refereed journals, conference proceedings, chapters in books, and other trade journals. He has also published three books with a USA publisher. Dr. Redhwi is a member of international professional societies such as the American Institute of Chemical Engineers (AIChE) and American Chemical Society (ACS). He is the current vice chairman of the Saudi Arabian Section of AIChE (SAS-AIChE).

### **DR. MUHAMMAD AL-SALEH**

Dr. Muhammed Al-Saleh is a Professor in the Chemical Engineering Department, King Fahd University of Petroleum and Minerals (KFUPM). He received his Ph.D. in Chemical and Petroleum Refining from Colorado School of Mines, Colorado, U.S.A., in 1981, his M.S. in Chemical Engineering from KFUPM, in 1978, and his B.S. in Chemical Engineering, also from KFUPM, in 1974. Dr. Al-Saleh's major research interests are in the area of catalysis, chemical reaction engineering, and electrochemical engineering. He has published extensively in many areas and specially in catalysis and electrocatalysis. He has supervised two Ph.D. students and two M.S. students. He was also involved in an international project on hydrogen energy. In addition, he has also successfully completed two KACST projects. Currently, he was heavily involved in the Saudi-Japanese Joint Research Program on Development of high Performance Catalysts for Heavy Oil Cracking. Since 1981, he has been involved heavily in teaching various undergraduate and graduate courses in chemical engineering. In addition, he was either a coordinator or a member in various successful short courses offered to the industries in Kingdom. He served as the chairman of chemical engineering department for the period 1987-89.

### **DR. RAMAZAN KAHRAMAN**

Dr. Ramazan Kahraman is a Professor in the Department of Chemical Engineering at King Fahd University of Petroleum & Minerals. He received a B.S. in Chemical Engineering from the Middle East Technical University, Ankara, Turkey, in 1986, graduating with High Honors standing and ranking first in class. He received his M.S. in May 1988 (GPA: 3.88/4.00) and Ph.D. in May 1993 (GPA: 4.00/4.00) from Montana State University, both in Chemical Engineering. He specialized in the areas of materials science and engineering (composite materials, polymer technology, corrosion) and transport phenomena. Dr. Kahraman has taught many undergraduate and graduate courses at different levels and areas of specialization. He has been nominated for the Excellence in Teaching Award for five years and received the award in the academic year 2005/2006. He is also actively involved in continuing education activities and supervision of undergraduate and graduate students. Dr. Kahraman has extensive experience in developing and implementing research projects in the areas of composite materials, polymer technology, corrosion and transport phenomena. He has authored or co-authored over 60 journal and conference publications. He received the Distinguished Researcher Award in 2001 (based on the research record of the previous four years) and Funded Research Project Award in 2005. He cooperates and works well with many people in different research areas. He is the coordinator of the Materials Research Group and an active member of the Fluid and Thermal Research Group in the Chemical Engineering Department. He is also actively involved in organizing symposium/workshops. Dr. Kahraman served as principal investigator or co-investigator on various funded research projects including "Preparation, Characterization and Testing of Polypropylene-Palm Fiber Composites", "Corrosion Protection of Steel by Catalyzed Polypyrrole Films" and "Water Absorption Behavior of Palm/Polypropylene Composites". He received the silver medal from KACST (King Abdulaziz City for Science and Technology) for the project "Inhibition of Reinforcing Steel Corrosion under Atmospheric Condition".

Dr. Kahraman was also involved with many independent projects through graduate student supervision. Titles of some of these studies are “Numerical Analysis of Entropy Generation in Laminar Viscous Fluid Flow in Rectangular Ducts”, “Preparation and Characterization of Palm Fiber-Polypropylene Composites” and “Studies of the Terephthalic Acid and Diphenyl Sulfone Liquid Crystalline Copolymer and its Blends”. Currently he is involved with three funded projects and three M.S. thesis studies which are “Increasing Enrolment in Graduate Programs”, “A Study on Environmental Degradation of Aluminum Joints Bonded by Rubber-Modified and Aluminum-Filled Epoxy Adhesive”, “Corrosion Investigation of Stainless Steel and Stainless Steel Clad Reinforcing Bars for Utilization in Corrosive Environment of Saudi Arabia”, “Design and Application of Highly Hydrophobic Thin Film Coating on Steel”, “Second Law Analysis of Compressible Flow through Circular Duct of Variable Cross-Section” and “Second Law Analysis of a Gravity Driven Liquid Film along an Inclined Plate”.

#### **DR. S. M. JAVAID ZAIDI**

Dr. Javaid Zaidi is an Associate Professor of Chemical Engineering at KFUPM. He obtained his PhD from the Chemical Engineering Department at Laval University Quebec, Canada in 2000. His PhD thesis research won the Quebec Government's FCAR award. He joined Chemical Engineering Department of KFUPM in September 2000. Through his academic career, Dr. Zaidi received many Awards, Scholarships, Prizes and Nominations from Aligarh Muslim University, KFUPM and Laval University, Canadian Government. Dr. Zaidi is actively involved in research with more than 75 refereed journal and conference publications/presentations and co-authored four book chapters, and publishing a book on "Polymer membranes for Fuel Cells" jointly edited by Prof. Matsuura of Ottawa University, Canada and will be published by Springer Pub. Co., New York, USA. His publications have earned over three hundred citations by peer researchers in reputed journals. He has been invited by the Chinese Academy of Sciences, French National Research Center, and GKSS Research Center, Germany for presentations. His interests are in the areas of Polymer membranes for Membrane-based separations, Reverse Osmosis, fuel cells and organic/organic separations, composite polymers, proton conducting materials, and catalysts for refinery and petrochemical applications. Currently, Dr. Zaidi is the principal investigator or co-investigator of many research projects of approximately SR 2.5 million budget. His projects were funded by KFUPM; King Abdul Aziz City for Science and Technology as well as SABIC. He supervised/co-supervised 6 MS students and served as a committee member for another 6 MS students. Dr. Zaidi received KFUPM “Distinguished Research Award” for the year 2006 and College of Engineering "Excellence in Research Award" in 2005. Dr. Zaidi is an invited reviewer for the Journal of Membrane Science, Journal of the Electrochemical Society, Journal of New Materials for Electrochemical Systems, Arabian Journal for Science and Engineering, KSU Journal of Engineering Science, Omani Journal of Engineering, King Abdulaziz City for Science & Technology (KACST), and KFUPM Deanship of Scientific Research.

### **DR. MUHAMMAD A. AL-ARFAJ**

Dr. Muhammad Al-Arfaj is an Associate Professor of Chemical Engineering at King Fahd University of Petroleum & Minerals. He received his B.S. from KFUPM with the Highest Honor in Chemical Engineering in 1995, his M.S. in 1999 and his Ph.D. in 2002 from Lehigh University, PA, USA. His M.S. and Ph.D. work was in process modeling, design and control, and in particular, he investigated the design and control of reactive distillation systems. Dr. Al-Arfaj has published more than eight journal papers and gave several presentations in international conferences in his area. Dr. Al-Arfaj rejoined KFUPM on April 2002. He worked with the Process & Control Systems Department in Saudi Aramco in the summer of 2002. Dr. Al-Arfaj has recently completed a research project for the National Methanol Company in Jubail to model and analyze the MTBE synthesis process and is currently working in four research projects one of which is funded by Saudi Aramco. Dr. Al-Arfaj has served as a Section Manager in the Center of Refining and Petrochemicals in the Research Institute from May 2004 to July 2005. Dr. Al-Arfaj is now the director of the office of international cooperation at KFUPM. He is teaching undergraduate courses in chemical engineering and conducting research in the areas of process modeling and control.

### **Dr. Abdulhadi A. Al-Juhani**

Dr. Abdulhadi Al-Juhani received his PhD degree in 2006 from the Chemical Engineering Department at The University of Akron, Akron, Ohio, USA. He joined the Chemical Engineering department at KFUPM in 2006 as an assistant professor. His research interests are in the areas of Polymer Blends and Nanocomposites, Mass Transfer, and Simulation of Chemical Processes. Dr. Al-Juhani has published his research results in two refereed journals and presented his scientific works in five international conferences such as the American Institute of Chemical Engineers annual meeting.

After receiving his B.S degree in Chemical Engineering in 1996 at KFUPM and prior to starting his graduate study, Dr. Abdulhadi Al-Juhni worked for 1 year as a process engineer with YANPET Petrochemical Co., Saudi Arabia, where he had several duties in the ethylene, ethylene glycol, and polyethylene production units.

During his academic service at the Chemical Engineering Department at KFUPM and until now, Dr. Al-Juhni taught many courses including polymer technology, introduction to chemical engineering, mass transfer, and chemical engineering computing. He also participated in teaching of two short courses provided by the department of chemical engineering in the area of separation processes and chemical reaction kinetics.