9th Topical Conference on Refinery Processing

Session 19 - Analysis/Characterization Tutorial
This session provides an introduction to hydrocarbon mixture analysis and characterization.

CoChair: Isabelle Henaut
Chair: James Speight

1. Interactions of Synthetic Additives with Petroleum Aggregates Probed by Small-Angle Neutron Scattering
   Keith L. Gawrys, Paul M. Lindemuth

2. Near-Infrared Modeling of Conjugated Diolefins in Selective Hydrogenation Units
   Clementina Lopez-Garcia, Hélène Biguerd, Nathalie Marchal-George, François Wahl

12. Measurements of the Association and Stability of Asphaltenes - a Multidiciplinary Approach
    Simon Ivar Andersen

Session 20 - Bottom of the Barrel Processing
This session will include a Keynote speech for the first paper.

CoChair: Jinwen Chen
Chair: Syamal K. Poddar

13. Changes in Asphaltene Structure and Stability during Hydrotreating
    Simon Ivar Andersen, Diep Duong, Jesper Bartholdy

14. Coke Quenching in the Delayed Coking Process
    Keith Wisecarver, Michael Volk

15. Stability of Water-in-Crude Oil Emulsions in the Burgan Oilfield
    Adel Elsharkawy, Harvey Yarranton, Taher Al Sahhaf, Mohamed Fahim

Session 21 - Desalting Tutorial
Desalter operation has a direct impact on crude column overhead corrosion control, metals content in conversion unit feed, and refinery waste water treatment. Heavier, higher metals and sulfur content crude oils are now frequently processed in many refineries. Finding ways to improve desalter performance has become a high priority in most refineries. At the same time, the processing of opportunity crude oils has made desalter operation more challenging. This session will concentrate on papers describing aspects of basic desalter operation. Papers are invited which cover best practices in current desalter vessel design,
equipment, and operating strategies.

**CoChair:** Andrew B. Woodside  
**Chair:** Larry Kremer

16 Developing Crude Pre-Treating Programs to Improve Downstream Operations  
*Sandra N. Garcia-Swofford,* Tony Potter

17 Solids Handling in Crude Oil  
*Alan Goliaszewski,* David Engel, Cato McDaniel, Harold Eggert

18 Controlling Quality Variations in the Feed to Desalters  
Larry Kremer

**Session 55 - Advances in Desalting**

New Developments in crude treatment  
**CoChair:** Andrew B. Woodside  
**Chair:** Larry Kremer

25 Parallel Comparison of Two Different Desalting Technologies—a Case Study  
*Shaya Movafaghian,* Tom Collins, James Chen

37 Bimodal Modulation for Enhanced Desalting  
*Gary W. Sams,* Kenneth W. Warren

44 New Control Technology for Desalter Optimisation  
Paul Hewitt, *Scott Vidrine*

45 Desalter Interface Control and Diagnostics Utilizing Sonar Transducers  
*R. Paul Clewis*

46 Removal of Calcium and Other Metal Species Form Crude Oil in the Desalting Process, Part 2  
*Larry Kremer,* Joe Nguyen, Jerry Weers

**Session 56 - Advances in FCC**

This session discusses recent trends in FCC operations, catalysts, reliability and any other area of interest. Papers are desired from FCC Operators, FCC designers, FCC catalyst vendors and anyone doing active research on FCC improvements.

**CoChair:** Marty Poole  
**Chair:** Lori T. McDowell

52 Heat of Cracking for Naphtha in Risers of Fcc Units  
*Carlos Alberto Dantas Moura,* Andrea de Rezende Pinho, Jose Mozart Fusco

60 How Fccu Trickle Valves Affect Catalyst Losses  
*Donald F. Shaw,* Richard E. Walter
Heat Transfer and Heat Removal in Flowing Dense Phase Fluidized Beds
Peter Van Opdorp, David Lomas

Molecular Based Kinetic Modeling of Fcc Process
Ryuzo Tanaka, Craig A. Bennett, Michael T. Klein

Evaluation of the Pid Performance for Fcc Units
Pleycienne Ribeiro Trajano, M. R. Wolf Maciel, Rubens Maciel Filho

Optimizing FCC: LPG rate and Cat Gasoline Octane Constraints
Marty Poole

Session 57 - Aromatics

The session on Aromatics will focus on new developments in production of aromatics (BTX) and aromatic derivatives, such as, but not limited to, ethylbenzene, cumene, linear alkylbenzene(LAB)styrene, phenol, bisphenol, teraphthalic acid, and polyethyleneteraphthalate. Papers covering best practices in operation, safety, maintenance, controls and optimization are also invited.

Cochairs: B. Erik Henry
Robert J. Schmidt

Chair: Bipin V. Vora

Investigation into a Novel, Green Technology for Aromatic Thiol Production, a Density Functional Theory (Dft) Study
Bradley R. Atkinson, Rayford G. Anthony

Commercialization of a New Ultra High Purity/ High Yield Phenol Process from Sunoco-Uop
Robert J. Schmidt Jr.

Production of Metaxylene within the Aromatic Complex
Philibert Leflaive, Luc Wolff, Karin Barthelet

Integrating Petrochemical Industry with a Fuel Oriented Refinery
Ahmed S. Khogeer, Mohammed Ahmed Balamesh

Factors That Affect the Quality of the Essential Lemon Oil (Citrus Aurantifolia) during the Distillation
Gamarra, F.M.C., Sakanaka, L.S., Tambourgi, E. B. Cabral

Session 89 - Advances in Hydroprocessing I

Environmental regulations mandating the production of ultra low sulfur diesel (ULSD, < 10 wppm S) and ultra low sulfur gasoline (ULSG, < 30 wppm S and ultimately < 10 wppm S) have challenged the refining industry to develop and implement new catalyst and process technology. Papers covering advances in catalyst and process development in hydroprocessing technology designed to help the refiner meet these
challenging specifications are solicited for this symposium. Hydroprocessing applications in distillate hydrotreating, FCC feed pretreating, desulfurization of FCC gasoline are welcome as well as novel technologies that address the production of clean fuels. Papers describing commercial experience in the application of new hydroprocessing catalysts and processes are also encouraged.

**CoChair:** Stuart Shih  
**Chair:** Peter Kokoyef

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<td>Effect of the Oxide Precursors on the Sulfurability of Hydrotreating Como(P) Catalysts</td>
<td>Anne D. Gandubert, Christelle Legens, Denis Guillaume, Christophe Pichon, Edmond Payen</td>
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<td>Study about Formation Al2o3-Tio2 Nanofibers as Supports for Hydroprocessing Catalysts</td>
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<td>Lawrence S. Kraus, Katsuhsa Fujita, Yuji Noguchi</td>
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**Session 90 - Advances in light hydrocarbon processing**

This session is for papers on catalytic reforming improvements in process flow, operations and catalysts.

**CoChair:** Russ Anderson  
**Chair:** Ken Peters

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Session 100 - Petrochemicals from Heavy Oils

Papers in this session will highlight the use of heavy feedstocks to make petrochemicals

CoChair: Stuart Shih

Chair: Michael C. Oballa

- 216 Transformation of Heavy Gas Oils Derived from Oil Sands to Petrochemical Feedstock
  Duke du Plessis, Catherine Laureshen

- 226 Selective Ring Opening of Diesel Fuels

- 228 Advanced Technology for Aromatics Saturation
  Frank Mey, Rainer Schoedel, Reinhard Geyer, Dirk Lose, Kristi Ann Morris, Paul Himelfarb

- 229 Effect of Chlorine, Fluorine and Titania on Surface Structure and Hydroprocessing Activity of Ni-Mo Catalysts Supported on Alumina
  Deena Ferdous, Narendra N. Bakhshi, Ajay K. Dalai, John Adjaye

Session 103 - Upgrading and Processing of Opportunity Crudes I

"Opportunity" crudes are generally characterized by a variety of properties undesirable to a refiner, such as high total acid number (TAN), high sulfur, nitrogen and aromatics content, high viscosity, etc. Although these crudes can cause corrosion and fouling problems in a downstream facility, they offer attractive discounts in crude prices. Effective methods and technologies to upgrade and process opportunity crudes can resolve these problems and provide attractive margins to the refiner. This session is geared towards exploring the current R&D and technology status on upgrading and processing of opportunity crudes. Papers are solicited on this topic in the areas of research studies to understand the fundamental science, current industrial strategies and technologies, and the development of new processes and technologies.

CoChair: Priya Rangarajan

Chair: Jinwen Chen
Session 130 - Advances in Hydroprocessing II

2nd session of same subject

CoChair: Stuart Shih
Chair: Peter Kokayeff

271 Comparative Study of Vapor-Liquid Equilibrium during Hydroprocessing of Different Petroleum Feedstocks
Jinwen Chen, Wei Jiang, Hong Yang, Zbigniew Ring

281 Value Driven Catalyst Developments in Fcc Pretreatment Service
Vito Bavaro, Pat Gripka, Alexei Gabrielov, Changan Zhang, John Smegal

297 Low Emission Diesel Production through Upgrading Lco
Roberto E. Galiasso

308 Effect of Promoters on Structural and Chemical Properties of Hydrotreating Catalysts

312 Hydrocracking for Clean Fuels Production
Suheil F. Abdo, Vasant P. Thakar, Bart Dziabala

313 Thermochemistry of Coking in Hydroprocessing Units: Modeling Competitive Naphthalene Saturation and Condensation Reactions
Paul Robinson, Lawrence S. Kraus
Session 133 - Energy Conservation

Energy conservation is becoming increasingly important in the refining and petrochemical industries. Economic pressures and rising fuel costs encourage more efficient use of energy within these industries so that operating costs can be reduced. Regulatory pressures are also forcing these plants to become more energy efficient so that CO2 emissions can be reduced. This session will address new developments related to energy conservation in refineries and petrochemical plants, which may include topics such as new equipment and processes, cogeneration, integration of refineries and power plants, and design techniques and methodologies that identify energy saving opportunities. Papers are encouraged from refiners, petrochemical producers, vendors, and academics, as well as anyone else with an interest in this area.

CoChair: Kirtan K. Trivedi
Chair: Michael A. Schultz

332 – Energy Conservation and Innovation of Basic Chemical Processes: Drivers and Barriers
Tao Ren

343 – Energy Savings for Refinery and Petrochemical Industries
Robin Smith

344 – Energy Integration - a Fresh Look for a Changed Energy World
Bill Townsend, Alan Ryder, Cyril Collins

345 – Combined Energy and Water Analysis for the Oil Sands Industry
Alberto Alva-Argaez, Luciana E. Savulescu, Abdelaziz Hammach

346 – Enhanced Heat Transfer Technology Application in Crude Units for Saving Energy
Kirtan K. Trivedi, Tom Rudy

356 – Extraction of Benzene from Wastewater Using Refinery Liquids by L-L Extraction Instead of Distillation
Ashok V. Naimpally, Marcia G. Zimmermann

357 – Debottlenecking of Heat Exchanger Networks Using Optimum Pressure Drops
Mohammad Hassan Panjeshahi, Nassim Tahouni

Mahmoud Bahy Noureldin, Ahmed S. Aseeri, Ali H Al-Qahtani, Saleh Al Hashimi
Session 145 - Upgrading and Processing of Opportunity Crudes II

2nd session of same subject

CoChair: Priya Rangarajan
Chair: Jinwen Chen

368 Compositional Analysis of Opportunity Materials: Characterization of Heavy Crude Oil and Bitumen by Fourier Transform Ion Cyclotron Resonance Mass Spectrometry
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372 The State-of-the-Art of Naphthenic Acid and Sulfidic Corrosion Evaluation and Prediction
Russell Kane, Elizabeth Trillo

390 Crude Oil Corrosivity Measurement Using Radioactive Tracer Technology
Douglas C. Eberle, Craig M. Wall, Martin B. Treuhaft

391 Effect of Naphthenic Acid Structure on Corrosion
Priya Rangarajan, Fred Holmes, Bruce Randolph

399 Biological Upgrading of Petroleum – Recent Developments and Research Needs
Abhijeet P. Borole

400 Market Developments for Opportunity Crude Processing
Stephen L. Jones

Session 175 - Control and Optimization in Refining II

2nd session of same subject

CoChair: Tim Olsen
Chair: Stuart Shih

401 New Techniques for Meeting New Product Spec and Products Demand under Catastrophic Failure through Multi Objective Multi Refinery Optimization
Ahmed S. Khogeer, M. Nazmul Karim

412 Optimization of the Benzine and Diesel Fuels Blending
Nickolai V. Lisitsyn, Nickolai V. Kuzichkin

416 Energy Management
Peter Stanley

417 Development and Implementation of Process Analytical Toolbox
Fangwei Xu, Edgar Tamayo, Biao Huang

Session 177 - Advances in Hydroprocessing III

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CoChair: Stuart Shih
Chair: Peter Kokayeff
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420 Developing Knowledge from Spent Hydroprocessing Catalyst
Chemical Analysis
Terry A. Reid

421 Recombination: A Complicating Issue in FCC Naphtha
Desulfurization
Laura E. (Jones) Leonard, Peter Kokayeff

422 A Novel Oxidative Desulfurization (Oxyds) Process for Diesel and
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Tzong-Bin Lin, Hsun-Yi Huang, Jyh-Haur Hwang, Hung-Chung
Shen, Karl T. Chuang

432 Mathematical Modeling of a Trickle Bed Bio-Desulfurizer of Hydro-
Treated Diesel with Recycle for the Production of Ulsd (Ultra-Low
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Manasi Mukhopadhyay, Prof. Ranjana Chowdhury, Prof. Pinaki
Bhattacharya

Session 188 - Upgrading and Processing of Opportunity
Crudes III

3rd session of same subject

CoChair: Priya Rangarajan
Chair: Jinwen Chen

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Jerold I. Danis

452 Crude Oil Management: Reduce Operating Problems While
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Larry Kremer

458 Metallurgy for Opportunity Crudes
Tim Ruggles

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Lawrence R. White, Craig Winslow, James Rue

476 A Comprehensive Approach to Assessing Opportunity Crudes
Doug Milton, James Feather, Kenneth Bagnoli, James McLaughlin

477 Refinery Optimum Crude Blending and Operation
Kiyomi Meason

Session 215 - Control and Optimization in Refining I

This session offers an opportunity to hear about process control success
stories within the refining and petrochemical industry. The preferred
subject matter includes innovative solutions to process control issues
along with the benefits of optimization programs. If you have a process
control application that would be interesting for others to learn about, please submit an abstract for approval.

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Chair: Tim Olsen

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543 Wireless Instrumentation Enables New Best Practices in Monitoring and Automation  
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544 Using Industrial Wireless Sensors to Monitor Safety Showers and Eye-Wash Stations  
Doug Eberhart

545 Advanced Control Strategy to a Fermentation Process to Obtain Ethanol  
E. R. Duarte, Laércio Ender, R. Maciel Filho

Session 220 - Fouling Mitigation

Today fouling mitigation in refineries is particularly critical. Since there is a shortage of refinery capacity, there are strong incentives for each refinery to maximize the days on stream. In addition, keeping insulating foulants off heat exchanger surfaces greatly reduces energy consumption and carbon dioxide emissions. Therefore, this session on fouling mitigation will review the causes of refinery fouling and case studies of fouling mitigation. Causes will include asphaltene fouling, corrosion induced fouling, and polymerization of conjugated olefins.
Mitigation methods include additives, oil compatibility prediction, heat exchanger design, heat exchanger inserts, and optimum cleaning scheduling.

**CoChair:**  Kirtan K. Trivedi  
**Chair:**  Irv Wiehe  

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