GAS CONVERSION
THE CLEAN ENERGY
OF THE FUTURE

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Dear NGCS 10 Participants,

On behalf of the Local Organizing Committee we extend you a warm welcome to Qatar: The GTL Capital of the World and host of the tenth edition of the Natural Gas Conversion Symposium. This international gathering takes place in Doha 2–7 March in the beautiful setting of the Ritz-Carlton hotel. More than 300 researchers, scientists and industry executives from 32 countries will participate in the Symposium, representing the diverse mix from academia and industry that has been a hallmark of this symposia series for almost three decades.

Qatar has the third largest reserves of natural gas in the world and is the leading exporter of LNG. In addition, Qatar is the home of the two largest operating GTL plants in the world: ORYX GTL, a joint venture between Qatar Petroleum and Sasol, and Pearl GTL, a joint project between Shell and Qatar Petroleum, and is experiencing major expansions in the chemical and petrochemical sectors.

His Excellency Dr. Mohammed bin Saleh Al-Sada, Qatar’s Minister of Energy and Industry, is the Symposium’s patron, and the major industrial stakeholders from Qatar have provided generous financial support for this event and participated in its organization. Thanks to generous support from local and international companies we have been able to provide financial assistance to oral and poster presenters from academic institutions, plenary and keynote speakers, all presenters from Qatar, as well as faculty and students from Qatar University and Texas A&M University at Qatar, enabling their participation in the Symposium. This event will contribute to strengthening Qatar’s growing reputation as a regional and international hub for education and scientific research.

We gratefully acknowledge the help of the NGCB, its International Scientific Advisory Board, and all institutions and companies that have supported this event.

We wish all participants a productive and memorable meeting, and invite you to participate in the networking events to take advantage of the opportunities for enhanced discussions and the forging of friendships that will last for many years.

Dragomir B. Bukur  
Texas A&M University at Qatar

Youssif A. Saleh  
Qatar Shell Research & Technology Center

CO-CHAIRMEN OF THE LOCAL ORGANIZING COMMITTEE

Doha, Saturday, 2 March, 2013
THE AWARD FOR EXCELLENCE IN NATURAL GAS CONVERSION

The Natural Gas Conversion Board and its International Scientific Advisory Committee sponsor and steward the Award for Excellence in Natural Gas Conversion, presented every three years during the Natural Gas Conversion Symposium to recognize significant and enduring contributions to science and technology for the conversion of natural gas to valuable products.

The award has been presented just six times in the past twenty-five years, and recognizes individuals who – in the eyes of their peers – have made noteworthy contributions in the field of natural gas conversion and the development of technologies that are likely to play an important part in meeting the world’s chemical and fuel requirements in the years ahead. The previous award recipients are Jack Lunsford (1993), Jens Rostrup-Nielsen (1998), Lanny Schmidt (2001), Enrique Iglesia (2004), David Trimm (2007) and Anders Holmen (2010).

Professor Krijn de Jong (Utrecht University, the Netherlands) has been chosen as the recipient of the 2013 Award for Excellence in Natural Gas Conversion. Professor de Jong is recognized for consistently making noteworthy contributions to the field of natural gas conversion and the development of technologies that are likely to play an important role in meeting the world’s chemical and fuel requirements in the years ahead. These contributions are based on a powerful combination of scientific excellence, originality and societal relevance. In particular he has made eminent contributions to the synthesis, structural characterization, fundamental understanding and utilization of solid catalysts for the conversion of natural gas to fuels and chemicals.

Specific highlights include his research on cobalt particle size effects for Fischer-Tropsch synthesis, and supported iron nanoparticles for the direct conversion of synthesis gas to lower olefins. In addition, Professor de Jong has served as a leading figure both nationally and internationally in his field of catalysis and chemistry, via chair and board membership roles in conferences, program committees, advisory councils, professional associations, and editorial board roles for leading international scientific journals and book series.

Last but not least, de Jong is also recognized for being an inspirational and driven teacher, using his didactic talent to equip a younger generation with the skills necessary to make contributions themselves to technology development in natural gas conversion and other areas.

Professor de Jong will deliver the Award Plenary Lecture on Tuesday, March 5th.
# SYMPOSIUM SCHEDULE

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<th>MONDAY, 4 MARCH 2013</th>
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<th>WEDNESDAY, 6 MARCH 2013</th>
<th>THURSDAY, 7 MARCH 2013</th>
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<td>Al Mukthasar</td>
<td>Registration 7.30 – 16.00</td>
<td>Registration 8.00 – 16.00</td>
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<td>Al Wosail 1</td>
<td>OP2.11</td>
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<td>KN5.2</td>
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<td>OP5.06</td>
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<td>OP2.11</td>
<td>KN1.2</td>
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<td>Al Mukthasar</td>
<td>OP5.07</td>
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### SATURDAY, 2 MARCH 2013
- **Registration**: 7.30 – 16.00
- **Opening Ceremony**: 8.00 – 9.00
- **Topic 2**: Synfuels
- **Topic 3**: Conversion
- **Topic 4**: Energy
- **Topic 5**: Commercial

### Sunday, 3 March 2013
- **Registration**: 8.00 – 16.00
- **Optional Visits**: ORYX GTL, Pearl GTL, QAPCO
- **Topic 1**: Production and Purification
- **Topic 2**: Synfuels
- **Topic 3**: Conversion
- **Topic 4**: Energy
- **Topic 5**: Commercial

### Monday, 4 March 2013
- **Registration**: 8.00 – 11.00
- **Conference**: 8.00 – 17.30
- **Optional Visits**: ORYX GTL, Pearl GTL, QAPCO
- **Poster Session**: 16.00 – 18.00
- **Welcome Reception**: 18.30 – 20.30
- **Dinner**: 19.00 – 21.30

### Tuesday, 5 March 2013
- **Registration**: 8.00 – 16.00
- **Conference**: 8.00 – 17.30
- **Optional Visits**: ORYX GTL, Pearl GTL, QAPCO
- **Poster Session**: 16.00 – 18.00
- **Welcome Reception**: 18.30 – 20.30
- **Dinner**: 19.00 – 21.30

### Wednesday, 6 March 2013
- **Registration**: 8.00 – 11.00
- **Conference**: 8.00 – 17.30
- **Optional Visits**: ORYX GTL, Pearl GTL, QAPCO
- **Poster Session**: 16.00 – 18.00
- **Welcome Reception**: 18.30 – 20.30
- **Dinner**: 19.00 – 21.30

### Thursday, 7 March 2013
- **Registration**: 7.30 – 16.00
- **Conference**: 8.00 – 17.30
- **Optional Visits**: ORYX GTL, Pearl GTL, QAPCO
- **Poster Session**: 16.00 – 18.00
- **Welcome Reception**: 18.30 – 20.30
- **Dinner**: 19.00 – 21.30

### Meals
- **Lunch**: 12.00 – 14.00
- **Coffee Break**: 10.00 – 10.30
- **Coffee Break**: 14.00 – 14.30
- **Coffee Break**: 16.00 – 16.30
- **Dinner**: 19.00 – 21.00
- **Gala Dinner**: 19.00 – 22.00
FLOOR PLAN

ORAL PROGRAM

SATURDAY, 2 MARCH 2013

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<td>18.30 – 20.30</td>
<td>WELCOME RECEPTION</td>
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FATEH AL-KHAIR 1&2: Registration
AL MUKTHASAR 1&2: Plenary
AL WOSAIL 4: Breakout
AL WOSAIL 2&3: Lunch
AL WOSAIL 1: Breakout
AL WOSAIL FOYER: Poster Presentations
10th Natural Gas Conversion Symposium (NGCS 10) The Ritz-Carlton, Doha, 2 – 7 March 2013

**MONDAY, 4 MARCH 2013**

**MORNING SESSIONS**

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<td>Registration</td>
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<tr>
<td>09:50 – 10:10</td>
<td>OP2.10 Interplay Between Pore Size and Metal Particle Nanospatial Distribution for the Stability of CuZnNiSiO2 Methanol Synthesis Catalysts</td>
<td>Room: AL MUKTHASAR</td>
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<tr>
<td>10:10 – 10:40</td>
<td>COFFEE BREAK</td>
<td>Room: AL WOSAIL FOYER</td>
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<tr>
<td>10:40 – 11:20</td>
<td>KNC2.1 – Utilization of Synthesis Gas for the Production of Fuels and Chemicals</td>
<td>Room: AL WOSAIL FOYER</td>
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<tr>
<td>11:40 – 12:00</td>
<td>OP2.13 Molecular Simulation and Experimental Measurements of the Diffusion Coefficients of Gases in Heavy Hydrocarbons for the Design of Gas-to-Liquid Processes</td>
<td>Room: AL WOSAIL FOYER</td>
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<tr>
<td>12:00 – 12:40</td>
<td>TOPIC 5: COMMERCIAL</td>
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<td>12:40 – 13:00</td>
<td>COFFEE BREAK</td>
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<tr>
<td>13:00 – 13:40</td>
<td>OP5.05 Advances in FT Multi-tubular Fixed Bed Technology</td>
<td>Room: AL WOSAIL FOYER</td>
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<tr>
<td>13:40 – 14:00</td>
<td>OP5.06 Expanding the Technology Limits in Synfuels Production</td>
<td>Room: AL WOSAIL FOYER</td>
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<tr>
<td>14:00 – 14:20</td>
<td>OP5.07 Fischer-Tropsch Technology Demonstration: Key Points for Scale-up Strategy from Pilot Reactors to Industrial Unit</td>
<td>Room: AL WOSAIL FOYER</td>
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<tr>
<td>14:20 – 14:40</td>
<td>OP5.08 Autothermal Reforming - A Preferred Technology for Conversion of Natural Gas to Synthesis Gas in Industrial GTL Applications</td>
<td>Room: AL WOSAIL FOYER</td>
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<td>14:40 – 15:00</td>
<td>TOPIC 1: PRODUCTION AND PURIFICATION</td>
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<td>15:00 – 15:20</td>
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<td>15:20 – 15:40</td>
<td>OP1.01 Microchannel Methane-to-Syngas Conversion over Alternative Catalyst Configurations</td>
<td>Room: AL WOSAIL FOYER</td>
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<tr>
<td>15:40 – 16:00</td>
<td>OP1.02 Catalytic Partial Oxidation of Methane in Platinum Foam Catalysts Studied by Spatially Resolved Methods</td>
<td>Room: AL WOSAIL FOYER</td>
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<td>16:30 – 17:10</td>
<td>OP1.03 In situ Raman and Isotopic Studies of Methane Partial Oxidation to Syngas over SiO2 Supported Rhodium and Iridium Catalysts</td>
<td>Room: AL WOSAIL FOYER</td>
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<tr>
<td>17:10 – 17:30</td>
<td>OP1.04 Mechanistic and Kinetic Insights into the Effect of Size of Tailored Rh Nanoparticles Supported on g-Al2O3 on Partial Oxidation of Methane to Syngas</td>
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<td>TOPIC 2: SYNFUELS</td>
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<td>18:00 – 18:30</td>
<td>TOPIC 5: COMMERCIAL</td>
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<td>14:00 – 14:40</td>
<td>KNC3.1 – Fundamental Issues on Practical Fischer-Tropsch Catalysts: How Surface Science Can Help</td>
<td>Room: AL MUKTHASAR</td>
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<td>14:40 – 15:00</td>
<td>OP2.15 Development and Validation of a Mathematical Model for the Description the Products Yield and their Vapour Liquid Repartition in the Fischer-Tropsch Synthesis</td>
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<td>15:00 – 15:20</td>
<td>OP2.16 Modulation of Heat and Mass Transfer Limitations in a Fischer-Tropsch Fixed Bed Reactor: Comparisons between Supercritical Flows and Gas Phase</td>
<td>Room: AL MUKTHASAR</td>
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<td>15:20 – 15:40</td>
<td>OP2.17 Kinetic Modelling of Fischer-Tropsch Synthesis on an Industrial Co-Ru Catalyst with Carbon Dependent Diffusivity Re-adsorption Approaches</td>
<td>Room: AL MUKTHASAR</td>
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<td>15:40 – 16:00</td>
<td>OP2.18 Synergistic Effects of Water and CO During Deactivation by Sintering of Cobalt Fischer-Tropsch Catalysts</td>
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**TOPIC 1: PRODUCTION AND PURIFICATION**

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<td>OP1.05 Thermodynamic Modeling and Optimization of Tri-Refining Reactors for Syngas Generation</td>
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<td>14:20 – 14:40</td>
<td>OP1.15 Catalytic Oxy-reforming for H2 and Syngas Production in Multistep Processes</td>
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<td>14:40 – 15:00</td>
<td>OP1.16 Partial Oxidation of Methane at Low Temperature over Various Supported Ni Catalysts and Addition of Sec-ond Metal as a Promoter</td>
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<td>15:00 – 15:20</td>
<td>OP1.17 Dry Reforming of CH4 on Supported Co and on Rh-Doped Co/Al2O3 Catalysts</td>
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<td>15:20 – 15:40</td>
<td>OP1.18 Volumetric Matrix Burners – New Way to Low-scale Syngas</td>
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<td>15:40 – 16:00</td>
<td>OP1.19 Thermodynamic Analysis of Co-based Methanol Synthesis</td>
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<td>14:20 – 14:40</td>
<td>OP3.05 The Use of Fluorosulfonic Acid as a Selective Oxidizing Agent for the Oxidative Coupling of Methane Over a High Surface Area Mn-NaZr2O4/SiO2 Catalyst</td>
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<td>OP3.06 Selective Oxidation of Methane to Value-added Products</td>
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<td>OP3.07 Rational Routes of Methane Conversion into Valuable Products over Systematically Studied Highly-Effective Catalysts</td>
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<td>OP3.08 Selective Direct Methane Oxidation over Platinum Based Solid Catalysts in Sulfuric Acid</td>
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<td>OP3.09 Combining Oxidative Coupling of Methane with CO2 Hydrogenation for Increasing the Yield of Higher Alkanes</td>
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<td>17:10 – 17:30</td>
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**TOPIC 1: PRODUCTION AND PURIFICATION ROOM: AL WOSAIL 4**

- **09.30 – 10.10**
  - KN1 2: The Scientific Basis for Synthetic Gas Production
  - Jens Aasted, Haldor Topsoe, Denmark

- **10.10 – 10.40**
  - COFFEE BREAK

- **10.40 – 11.00**
  - OP1.20: Recent Advances in Sour Water Gas Shift Technology
  - Jim Abbott, Johnson Matthey, United Kingdom

- **11.00 – 11.20**
  - OP1.21: Advances in ITM Technology for Syngas Production
  - Edward Foster, Air Products and Chemicals, United States of America

- **11.20 – 11.40**
  - OP1.22: The Challenge of Purification in Syngas Technologies
  - Martin Fowles, Johnson Matthey, United Kingdom

- **11.40 – 12.00**
  - OP1.23: Study of Metal Dusting Corrosion Initiation in Conversion of Natural Gas to Syngas
  - Hilde Venvik, Norwegian University of Science and Technology, Norway

- **12.20 – 14.00**
  - LUNCH

**TOPIC 2: SYNFUELS ROOM: AL MUKTHASAR**

- **09.30 – 09.50**
  - OP2.19: Impact of Crystallographic Structure on Cobalt Fischer-Tropsch Catalyst Performances
  - Laure Braconnier, CSIRO, Australia

- **09.50 – 10.10**
  - OP2.20: Preparation, Characterization, Activity and Stability of Titania-supported Cobalt Fischer-Tropsch catalysts using Deposition Precipitation
  - Thomas Eschmann, Utrecht University, The Netherlands

- **10.10 – 10.40**
  - COFFEE BREAK

- **10.40 – 11.00**
  - OP2.21: The State of Promoters in Co Fischer-Tropsch Catalyst
  - Geir Voie, Norwegian University of Science and Technology, Norway

- **11.00 – 11.20**
  - OP2.22: Titania Doped Silicon Carbide (SiC) Containing Cobalt Catalyst for Fischer-Tropsch Synthesis
  - Francis Luck, Total, France

- **11.20 – 11.40**
  - OP2.23: In Situ and Ex Situ Investigations on the Deactivation of Co-based Fischer-Tropsch Synthesis Catalysts
  - Nikolaas Tukoumis, Norwegian University of Science and Technology, Norway

- **11.40 – 12.00**
  - OP2.24: Optimization of Reduction Promoters on Cobalt Fischer-Tropsch Catalysts
  - Gordon Kelly, Johnson Matthey, United Kingdom

**TOPIC 3: CONVERSION ROOM: AL WOSAIL 1**

- **09.30 – 09.50**
  - OP3.09: Oxidative Coupling of Methane – A complex Surface/Gas Phase Mechanism with Strong Impact on the Reaction Engineering
  - Reinhard Schomaecker, TU Berlin, Germany

- **09.50 – 10.10**
  - OP3.10: Optimal Reactor Design for Ethylene Production from Methane
  - Thomas Serres, IRCELYON, France

- **10.10 – 10.40**
  - OP3.11: Exhaust-Gas Reforming of Methane in a Catalytic Microchannel Reactor
  - Irem Sen, Bogazici University, Turkey

- **10.40 – 11.00**
  - OP3.12: Rational Design of Platinum Nanoparticles for Propane Dehydrogenation
  - De Chen, Norwegian University of Science and Technology, Norway

**TOPIC 4: ENERGY ROOM: AL MUKTHASAR**

- **09.30 – 09.50**
  - OP4.01: Determination of the Active Phase of the ZnO/CuO-based Catalysts for H2 Production via Steam Reforming of Methanol
  - Edmond Abi-Aad, ULCO, France

- **09.50 – 10.10**
  - OP4.02: Steam Reforming of Ethane and Ethanol over Rh/Alumina: a Comparative Study
  - S. David Jackson, University of Glasgow, United Kingdom

- **10.10 – 10.40**
  - OP4.03: In-situ and Ex-situ Studies of Carbon Monoxide Oxidation over Fe-based Perovskite-type Catalysts for the Water Gas Shift Reaction at Medium Temperature
  - Edmond Abi-Aad, ULCO, France

- **10.40 – 11.00**
  - OP4.04: Application of CO-based Fischer-Tropsch Catalysts for the Water Gas Shift Reaction at Medium Temperature
  - Yu Wang, Xiamen University, China

- **11.00 – 11.20**
  - OP4.05: Concurrent Engineering in Micro-plant Scale; Comprehensive UniCat Approach for Oxidative Coupling of Methane (OCM)
  - Reinhard Schomaecker, Berlin Institute of Technology, Germany

**TOPIC 4: ENERGY ROOM: AL WOSAIL 4**

- **09.30 – 09.50**
  - OP4.10: Hydrogen Production Through CO2 Reforming of Methane over N(CH2CO2)2 Catalysts
  - Jerry Spivey, Louisiana State University, United States of America

- **09.50 – 10.10**
  - OP4.11: Understanding the Effect of Support Chemical Composition on the Mechanism of WGS Reaction over Supported Pt via Transient Isotopic Techniques
  - Angelos Efstathiou, University of Patras, Greece

- **10.10 – 10.40**
  - OP4.12: The Influence of Promoter on Ni/Al2O3 Catalyst in CO2-Steam Reforming of Methane to Syngas at High Pressure
  - Young Chul Kim, Chonnam National University, South Korea

- **10.40 – 11.00**
  - OP4.13: Investigation of the Etheno ODH Mechanism over NOx-based Catalysts via Transient Isotopic Studies
  - Eleni Heracleous, CPERI/CERTH, Greece

- **11.00 – 11.20**
  - OP4.14: Metal Oxides Modified NOx Catalysts for Oxidative Dehydrogenation of Ethane to Ethylene
  - Hubo Zhu, King Abdulaziz Univ. of Science and Technology, Saudia Arabia

- **11.20 – 11.40**
  - OP4.15: Conversion of Methane to Propylene via Methyl Halides: Effects of Morphology and Promoter on CoO2-Catalyzed Oxidative Chlorination of Methane
  - Ye Wang, Xiamen University, China
Building partnerships that deliver

From our home base in South Africa, Sasol is a global leader in gas-to-liquids (GTL) and coal-to-liquids (CTL) technologies, and is the world’s largest producer of synthetic fuels. Our international growth is based on our unique value proposition, which links our diverse businesses into an integrated value chain. This enables us to produce a range of high-value product streams, including liquid fuels, chemicals and low-carbon electricity.

Our ability to deliver sustainable shareholder value is premised on maintaining solid operations, and accelerating our growth strategy. The position we find ourselves in today is as much due to the strengths we have in our organisation as it is to the strong partnerships we are harnessing to deliver mutually beneficial results.

We pride ourselves on developing our people, keeping them safe and healthy, contributing meaningfully to the social and economic development of the countries and communities within which we work, and doing so in an environmentally responsible fashion.

Having shown our resilience in facing the global financial crisis, Sasol is well positioned to further expand and excel. In collaboration with our business, government and social partners, we look to the future with confidence.

www.sasol.com

We also take pride in being part of building our nation’s growth.

We are committed to helping the generations of the future piece together the elements of a promising life.

Our support and sponsorship of diverse and constructive community activities is just one way of living up to that commitment.

Better together... we deliver
### MORNING SESSIONS

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<td>08.00 – 11.00</td>
<td><strong>REGISTRATION</strong></td>
<td>FATEH AL-KHAIR</td>
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<tr>
<td>08.30 – 09.30</td>
<td>PNL – A Holistic Approach Based on Theoretical and Experimental Work to Industrial Development of Fischer-Tropsch Synthesis Catalysts</td>
<td>AL MUKTHASAR</td>
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<tr>
<td>09.30 – 09.50</td>
<td>Characterization of Synthetic Gas-to-Liquid Fuel Blends: Hydrocarbon Chain Length Effect on Fuel Properties</td>
<td>AL MUKTHASAR</td>
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<tr>
<td>09.50 – 10.10</td>
<td>Selective Synthesis of Gasoline from Syngas in Near-critical Phase</td>
<td>AL MUKTHASAR</td>
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<tr>
<td>10.10 – 10.40</td>
<td>COffEE BREAK ROOM: AL WOSAIL FOYER</td>
<td>AL WOSAIL FOYER</td>
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<td>10.40 – 11.00</td>
<td>Oxidation of Hägg Carbide at High Temperature Fischer-Tropsch Synthesis Captured In-situ</td>
<td>AL WOSAIL</td>
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<tr>
<td>11.00 – 11.20</td>
<td>Intensification of Fischer-Tropsch Catalyst Tests: An Optimized Methodology to Study the Catalysts Stability</td>
<td>AL WOSAIL</td>
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<tr>
<td>11.20 – 11.40</td>
<td>Self-organization in Fischer-Tropsch Synthesis</td>
<td>AL WOSAIL</td>
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<tr>
<td>11.40 – 12.20</td>
<td>KN2.4 – Recent Advances in Fischer-Tropsch Synthesis Technologies</td>
<td>AL WOSAIL</td>
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<tr>
<td>12.00 – 12.20</td>
<td>OP4.07 Effect of Lanthanum on the Properties of Copper, Cerium and Zirconium Catalysts for Preferential Oxidation of Carbon Monoxide</td>
<td>AL WOSAIL</td>
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<td>12.40 – 13.40</td>
<td>LUNCH</td>
<td>AL WOSAIL 2 &amp; 3</td>
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### SITE VISIT PROGRAM

**Thurday, 7 March 2013**

<table>
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<tr>
<td>08.30</td>
<td>DEPART BY BUS FROM RITZ-CARLTON DOHA LOBBY ENTRANCE</td>
</tr>
<tr>
<td>13.00</td>
<td>RETURN TO RITZ-CARLTON DOHA</td>
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The NGCS 10 program includes optional site visits to two of the largest and most innovative gas conversion projects on earth - ORYX GTL and Pearl GTL, and to one of the world’s leading petrochemical manufacturers, QAPCO. Located just outside Doha in Ras Laffan Industrial City, the GTL facilities will produce more than 3 billion barrels of oil equivalent over their lifetime from the world’s largest single gas field, the North Field in the Arabian Gulf. The petrochemical plant tour will take place at QAPCO’s facility located in nearby Mesaieed Industrial City.

The site visits, each of which includes a briefing at the facility by company representatives, will provide symposium participants with a firsthand look at the vanguard of commercial-scale gas conversion.

**ORYX GTL**

Owned jointly by Qatar Petroleum and Sasol, ORYX GTL is the world’s largest slurry bubble column reactor GTL plant. The facility has a capacity of 34,000 barrels per day, and when commissioned in 2006 it was the world’s first commercial-scale GTL plant.

At the heart of the facility is the Sasol Slurry Phase Distillate (SSPD) process, comprising of natural gas reforming, F-T conversion, and product upgrading. GTL diesel and naphtha produced at the facility are marketed internationally by Sasol Synfuels International.

**PEARL GTL**

Pearl GTL is the world’s largest GTL facility with a design capacity of 140,000 barrels a day of high quality GTL products used in the production of diesel, jet fuel, finished lubricants and chemical feedstock in addition to 120,000 barrels a day of ethane for petrochemical processes, liquefied petroleum gas (LPG) for domestic heating and cooking, and condensates as a feedstock for refineries.

While under construction Pearl GTL was the world’s largest oil and gas construction site, with more than 50,000 workers from 60 nations onsite at its peak. A joint development by Qatar Petroleum and Shell, the project shipped its first product in 2011 and is expected to reach full production this year. The products will reach customers in every major energy market through Shell’s global retail network.

**QAPCO**

Established in 1974, Qatar Petrochemical Company (QAPCO) is one of the leading petrochemical producers and suppliers in the world, and began full commercial production in 1981. The company’s main products are Ethylene, Low Density Polyethylene, and Sulphur, which is an additional sellable commodity generated as a by-product in the production process.

Located in the Mesaieed Industrial City, QAPCO’s manufacturing facilities consist of an Ethylene plant with a designed annual capacity of 720 KTA, two Low Density Polyethylene (LDPE) plants with a global capacity of 400 KTA, a Sulphur plant of 70 KTA, a Hydrogenated Propane/Butane mix unit of 55 KTA, and a Hydrogenated Pygasoline unit of 45 KTA, besides the self-sufficient utilities plants and other offsite and auxiliary facilities.

QAPCO recently completed an expansion of LDPE capacity by establishing a third LDPE plant with a capacity of 250 KTA, expandable to 300 KTA.
POSTER PROGRAM

SUNDAY, 3 MARCH 2013

16.30 – 18.00

Refer to abstracts for complete list of authors and affiliation

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<td>P01.01 The Catalytic Activity of Calculated Hydratecils for Methane Dry Reforming Reaction</td>
<td>Zoulikha Abbessadik, Laboratoire de Chimie du Gaz Naturel, Algeria</td>
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<tr>
<td>P01.02 CO2 Reforming Methane over Ni-alumina-earth Metal/Au203 Catalysts</td>
<td>Luis J. Almeyra Arebaila, University of Malaga, Spain</td>
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<tr>
<td>P01.03 Synthesis by the Partial Oxidation of Methane over NiO/Y2O3/ZrO2</td>
<td>Elisabete Assaf, University of Sao Paulo, Brazil</td>
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<td>P01.04 High Capacity CO2 Capture by Polymeric Polymers at Pre- and Post- Combustion Conditions</td>
<td>Mot Althan, Qatar University, Qatar</td>
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<td>P01.05 Synthesis by Dry Reforming of Methane over LnNi1-xCoxO3Catalyst Supported on Silica</td>
<td>Soraya Brandao, UFBA, Brazil</td>
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<td>P01.06 Suppression of Carbon Deposition over NiMgO2/Au203 Catalysts with Metal Dyes for Steam and Carbon Dioxide Reforming of Methane</td>
<td>Jeongwan Cho, Chonnam National University, South Korea</td>
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<td>P01.07 Ordered Mesoporous MGO-Au203 Composite Oxo Complexes Supported Ni-based Catalysts for CO2 Reforming of CH4</td>
<td>Lingjun Chou, Lanzhou Institute of Chemical Physics, China</td>
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<td>P01.08 Catalytic Partial Oxidation of Ethane over Rh and Pt Honeycomb Catalysts with Sulphur Addition</td>
<td>Ilaria Gimmi, CNR, Italy</td>
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<td>P01.09 Effects of the Nature of Collodial CoNiPs on the Aqueous Fischer-Tropsch Synthesis</td>
<td>Jorge Delgado, UPV, Spain</td>
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<td>P01.10 Solutions to Catalyst Migration in Autothermal Reformers</td>
<td>Martin Flowes, Johnson Matthey, United Kingdom</td>
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<td>P01.11 Synthesis and Characterization of Alumina Supported Nickel Nanoparticles Catalyst by Polyol Method; Effect of NaOH</td>
<td>Tuba Gürkaynak Altincekic, Istanbul University, Turkey</td>
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<td>P01.12 The Effect of Preparation on the Structure of Au-modified Ni/MgO203 Catalysts and its Methane Dry Reforming Activity</td>
<td>Aliya Galina, Centre for Energy Research, Hungary</td>
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<td>P01.13 The Effect of Microwaves and the Steam Reforming of Ethanol over Ruthenium/Alumina</td>
<td>S. David Jackson, University of Glasgow, United Kingdom</td>
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<td>P01.14 Effect of Fe on Perovskite Typ Catalysts over Steam CO2 Reforming of Methane</td>
<td>Dong Ju Moon, Korea Institute of Science and Technology, South Korea</td>
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<tr>
<td>P01.15 Studies on the Steam CO2 Reforming of Methane over Modified LaNiO3 Perovskite Catalysts for Applications in GTL-PPG Process</td>
<td>Jin Hee Lee, Korea Institute of Science and Technology, South Korea</td>
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<td>P01.16 Comparison of Hydrogen Production by TR and APR of Olyxerol</td>
<td>Dong Ju Moon, Korea Institute of Science and Technology, South Korea</td>
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<td>P01.17 Catalytic Partial Oxidation for Syngas Production at Elevated Pressure Using Monolith Catalyst</td>
<td>Shigeru Kado, Chiyode Corporations, Japan</td>
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POSTER PROGRAM

SUNDAY, 3 MARCH 2013

P01.20 Low Temperature Methane Reforming over Ni and Rh Catalysts Supported on Lanthana Modified Ceria-zirconia | Angelika Lemonidou, Aristotle University Thessaloniki, Greece |
| P01.21 Production of Bio-syngas by Steam Reforming of Biomass tar over Highly Active and Reusable Ni-Fe/MgAl2O4 Catalysts | Qiao Li, Tsinghua University, China |
| P01.22 Promoted Ni/CNTs Catalyst for Methane Reforming of Carbon Dioxide | Qingsuang Ma, University of Toyama, Japan |
| P01.23 Conversion of Methane and CO2 to Synthesis Gas | Zulkhairi Mansour, Institute of Combustion Problems, Kazakhstan |
| P01.24 Effect of the Preparation Method on the Properties of Ni-Co/La203 Catalysts in the Oxidative Reforming of Methane | André Martins, Universidade Federal da Bahia, Brazil |
| P01.25 Performance of Ni/MgO-Au203 Catalysts in Oxidative Steam Reforming of Methane | André Martins, Universidade Federal da Bahia, Brazil |
| P01.26 The Aerodynamic, Thermodynamic and Chemical Analysis of Carbon Dioxide Reforming of Methane to Produce Syngas | Adar Pacifico dos Santos, Federal University of Sergipe, Brazil |
| P01.27 Preparation Characterization and Performance Evaluation of Metallic Foam Catalyst for Steam-CO2 Reforming of Methane | Daek Park, Chosun University, South Korea |
| P01.28 Effect of Calcination Temperature on Cake Formation and Mechanical Strength of Ni-CoMgO203 Catalysts for Carbon Dioxide Reforming of Methane | Neetu Park, Korea Research Institute of Chemical Technology, South Korea |
| P01.29 Dry Reforming and Pyrolysis of Methane in a Pulsed Compression Reactor | Sander Rosjon, Twente University, The Netherlands |
| P01.30 Tar Gasification to Syngas over a Novel Rh-based Catalyst | Oenmar Russo, Istituto di Ricerche sulla Combustione, Italy |
| P01.31 Relationship Between Surface Basicity of Cu Catalysts and Catalytic Activity for Water-gas-shift Reaction | Kentarou Saga, Ehime University, Japan |
| P01.32 Computational Studies On Several CO2 Removal Processes in GTL Process | Jee Sun Shin, Dongguk University, South Korea |
| P01.33 Catalytic Study of CuO/Cu2O-Al203 System for Water Gas-shift Reaction | Tatiana Silva, UFSCar, Brazil |
| P01.34 Evaluation of Micro-Structured Systems for Dry Reforming Of Methane | Aleksandros Souza, UFPE, Brazil |
| P01.35 Thermodynamic Isotope Effects in Methane Steam Reforming | Christoph Sprung, Utrecht University, The Netherlands |
| P01.36 Oxidation of Methane to Synthesis Gas on Nano-sized Catalysts | Stoiljan Tanev, Belgrade Institute of Organic Catalysis and Electrochemistry, Kazakhstan |
| P01.37 Method Used to Synthesis Solid Materials for CO2 Removal in Natural Gas | Valeria Vicentini, Clariant, Brazil |
| P01.38 An Investigation upon Improvement in Stability of Ni/5SiO2 Catalysts in Partial Oxidation of Methane into Synthesis Gas | Weihong Xia, Xiamen University, China |
| P01.39 Production of Methane and Hydrogen from Lignin by Supercritical Water Gasification with Supported Metal Catalysts | Atsuko Yamaguchi, National Institute of Advanced Industrial Science and Technology, Japan |
| P01.40 High-temperature Stable Ni-Cu-Zr-O Nanocomposite Catalyst for CO2 Reforming of CH4 | Tiejun Zhao, Shanghai Advanced Research Institute, China |
**MONDAY, 4 MARCH 2013**

10th Natural Gas Conversion Symposium (NGCS 10) The Ritz-Carlton, Doha, 2 – 7 March 2013

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### POSTER PROGRAM

**16.30 – 18.00**

**TOPIC 2: SYNFUELS**

**PO2.01**

Dimethyl Ether Production: Effect of Solvent in the Co-precipitation of Al2O3 Catalysts Modified by SiO2

Elisabete Assal, University of São Paulo, Brazil

**PO2.02**

Fischer-Tropsch Synthesis Performance of the Cobalt Supported on Carbon-coated Ni/SiO2 Catalysts

Jing Wook Bae, Sungkyunkwan University, South Korea

**PO2.03**

Carbon Monooxide Conversion over Modified Algerian Clay Material

Ahmed Boudian, University of Mostaganem, Algeria

**PO2.04**

Selective Syngas Conversion to Ethanol over a Nanosized NiMoS2 Catalyst

Jorge Beltrann, ARCET, Australia

**PO2.05**

Coal Syngas Conversion over 15%Co/Al2O3 Catalyst - Effects of Activation Procedures

Dragomir Bukar, Texas A&M University at Qatar, Qatar

**PO2.06**

Nanoscale Distribution in Co/SiO2 Fischer-Tropsch Catalysts Controlled by Drying

Krijn de Jong, Utretch University, The Netherlands

**PO2.07**

Effect of La on the Co2C Formation for the Synthesis of Alcohols from Syngas

Yunjie Ding, Dalian Institute of Chemical Physics, China

**PO2.08**

Butane Synthesis from Methane and/or Carbon Dioxide

Kazu Fuyujima, University of Kitakyushu, Japan

**PO2.09**

Enhancement in the Catalytic Activity and Stability of Ce/Al2O3 Catalysts for Fischer-Tropsch Synthesis: Alumina Support Modification Effects

Kyoung-Su Na, Korea Research Institute of Chemical Technology, South Korea

**PO2.10**

Efficient Catalyst Preparation Method Regulating Size and Shape with Saccharides and Phosphorus

Kyoung-Su Na, Korea Research Institute of Chemical Technology, South Korea

**PO2.11**

Spectroscopy Study of Rh/MnO/SiO2 Catalysts for the Conversion of Syngas to Alcohols

Yi-Fan Han, East China University of Science & Technology, China

**PO2.12**

The Catalytic Hydrogenation of CO and CO2

Kijun Hocine, University M. Mammeri de tizi Ouzou, Algeria

**PO2.13**

Effect of Catalyst Properties on the C5+ Selectivity During Co-based Fischer-Tropsch Synthesis

Anders Holmen, Norwegian University of Science and Technology, Norway

**PO2.14**

Fischer-Tropsch Synthesis and Thermodynamics

Anders Holmen, Norwegian University of Science and Technology, Norway

**PO2.15**

Mono- and H-bimolecular: Rhodium Compounds/Mordenite as the Catalysts for Conversion of Ethanol to Hydrocarbons

Elhar Imamov, Institute of Petrochemical Processes, Azerbaijan

**PO2.16**

The Effect of Rhodium Precursor on the Activity and Selectivity of CO Hydrogenation Catalysts

S. David Jackson, University of Glasgow, United Kingdom

**PO2.17**

Low-temperature and Low-pressure Methanol Synthesis in Liquid-phase Catalyzed by Copper-alkoxide Systems

Fahim Saeed, Texas A&M University College, Norway

**PO2.18**

Activated Carbon Modified Fe-Mo-Cl Catalyst for Light Difluoro Synthesis from CO Hydrogenation

Yohsho Jin, University of Toyama, Japan

**PO2.19**

TRAS: A Versatile Technology for the Conversion of Synthetic Gas to Gasoline

Pern Joensen, Haldor Topsøe, Denmark

**PO2.20**

Hybrid Catalyst for the Conversion of Syngas to Hydrocarbons

Kandawamy Jothimurugan, Chervon, United States of America

**PO2.21**

Characterization of Spherical α-alumina Supported Cobalt Catalysts for Fischer Tropsch Synthesis

Dong Ju Moon, Korea Institute of Science and Technology, South Korea

**PO2.22**

New Activation and Regeneration Method of Cobalt Catalysts for Fischer-Tropsch Synthesis

Gourabjy Kwek, Korea Research Institute of Chemical Technology, South Korea

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**TOPIC 5: COMMERCIAL**

**PO5.01**

Methanol Production from Anaerobic Digestion of LABANHO Whey

Ibrahim Abu Reesh, Qatar University, Qatar

**PO5.02**

Synergy Between GTL and EOR Through Simultaneous Production of O2 and N2

Gerhard Boysen, Linde, Germany

**PO5.03**

Horses for Courses: Methanol Plant Process Options

Martin Fowles, Johnson Matthey, United Kingdom

**PO5.04**

Compact Heat Exchange Reactors for Gas to Liquid Applications

Zhuyu Xu, Chart Energy & Chemicals, United States of America

**PO5.05**

Presynthesis Carbidization and Preparation of Fe-CO Hydroprocessing Over Pt Catalysts

Sahoon Kim, Gyeongsang University, South Korea

**PO5.06**

Synthesis, Characterisations of Rh, Pd and Pt Supported over Fe-PtPc. Activity in Toluene Oxidation

Ouira Mhammed, University of Béjaia, Algeria

**PO5.07**

Small-scale Methanol Synthesis Reactors Enabled by Conductive Structured Catalysts

Andrea Montebelli, Politecnico di Milano, Italy

**PO5.08**

Characteristics of Integrated Micro Packaged Bed Reactor-Hot Exchange Configurations in the Direct Synthesis of Dimethyl Ether

Hilde Venvik, Norwegian University of Science and Technology, Norway

**PO5.09**

Modular Reactors for the Fischer-Tropsch Synthesis Based on Highly Conductive Honeycomb Monoliths

Carlo Giorgio Visconti, Politecnico di Milano, Italy

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**AL WOSAIL FOYER**

**PO2.23**

Selective Synthesis of Gasolines from Syngas in Near-critical Phase

Xiaofeng Li, University of Kitakyushu, Japan

**PO2.24**

Measuring and Optimization of a Pilot-scale Fischer-Tropsch Synthesis Reactor for the Production of Light Olefins

Norim Park, Ajou University, South Korea

**PO2.25**

Hydrocracking of n-paraffin Wax over Pt Catalysts Supported on H-Y Zeolites

Eun Duck Park, Ajou University, South Korea

**PO2.26**

Effect of a Support on Fischer-Tropsch Synthesis over Co/SiO2

Eun Duck Park, Ajou University, South Korea

**PO2.27**

Comparative Study of Cobalt Fischer-Tropsch Catalyst Sintering in Fixed-bed and Slurry Reactors

Andre Rhodk, Unité de Catalyse et de Chimie du Solide, France

**PO2.28**

Fischer-Tropsch Catalyst Pre-treatment for Enhanced Liquid Synfuel Production

Valentie Sage, CSIRO, Australia

**PO2.29**

Different Types of Active Cobalt in Polymetal Composite Catalysts for Fischer-Tropsch Synthesis

Ulja Senera, Technological Institute for Superhard and Novel Carbon Materials, France
### POSTER PROGRAM

**TOPIC 3: CONVERSION**

**PO3.01** Oxidation Dehydrogenation of Ethanone over ZrO2 Promoted by Nickel  
Nector Armando Jimenez Herrera, Mexican Petroleum Institute, Mexico

**PO3.02** Oxygen-assisted Catalytic Dehydrogenation of Propane  
Eidra Andrea Bakkalan, Norwegian University of Science and Technology, Norway

**PO3.03** New Feedstock for Acrylonitrile Production  
Mihai Hasna Florina, University of Bucharest, Romania

**PO3.04** Catalytic Behaviors of a Bi-functional System for the One Step Synthesis of DME by CO2 Hydrogenation  
Francesco Fioretti, National Council of Research, Italy

**PO3.05** Partial Oxidation of Methane to Methanol over Substituted Molybdeno-alkylsilicates of Keggin Type  
Sami Necrié, University M. Mammeri de Tiizi Ouzuz, Algeria

**PO3.06** Oxidative Dehydrogenation of Propane to Propylene over Mesoporous Alumina-supported Nickel Oxide Catalysts  
Chuanjing Huang, Xiamen University, China

**PO3.07** Characterization of a Ni50O/Ru207-4003 Catalyst for Conversion of Ethylene to Propylene  
Klaus-Joachim Jens, Telemark University College, Norway

**PO3.08** Methane Steam Reforming in a Two Zone Fluidized Bed Reactor for Hydrogen Production  
Miguel Mirandés, University of Zaragoza, Spain

**PO3.09** Multi-ZSM-5 Catalysts for the Catalytic Dehydrogenation of Methane: Optimization of the Preparation Method  
Miguel Mendoza, University of Zaragoza, Spain

**PO3.10** Aluminum Modified Algarian Clay and Graphitised Sillicates Layers by Rh, Ni, Pd and Ce. New Catalysts [1,107/Al/Fe/Pt Containing Hexagonal Phases Very Active in the Dry Reforming of CH4]  
Goura Mohamed, University of Blida, Algeria

**PO3.11** New Perspectives for Process and Catalyst Development in Catalytic Reforming with High Throughput Technologies under Industrially Relevant Conditions  
Michael Paul, Max Germany

**PO3.12** Enhancing the Natural Gas Value Chain by Catalysis  
Themba Tshabalala, University of the Witwatersrand, South Africa

**PO3.13** Selective Oxidative Dehydrogenation of Ethane over Mo-VTeNbO Catalysts  
Ole Swang, University of Oslo, Norway

**PO3.14** Performance of a Dual Circulating fluidized Bed Reactor for the Mo/H2SM-5 Catalyzed Non-oxidative Methane Dehydroaromatization  
Zhanguo Zhang, National Institute of Advanced Industrial Science and Technology, Japan

**PO3.15** Oxidative Condensation of Methane to Ethylene over Mo/H2SM-5 Catalysts  
Erik Jan Ras, Atrium, The Netherlands

**PO3.16** Oxidative Dehydrogenation of Propane to Propylene over Mesoporous Alumina-supported Nickel Oxide Catalysts  
Chuanjing Huang, Xiamen University, China

**PO3.17** Characterization of a Ni50O/Ru207-4003 Catalyst for Conversion of Ethylene to Propylene  
Klaus-Joachim Jens, Telemark University College, Norway

**PO3.18** Methane Steam Reforming in a Two Zone Fluidized Bed Reactor for Hydrogen Production  
Miguel Mirandés, University of Zaragoza, Spain

**PO3.19** The Mechanism of Deactivation of Nanosized zeolite-based Mo/H2SM-5 Catalyst in the Methane Dehydroaromatization  
Sami Necrié, University M. Mammeri de Tiizi Ouzuz, Algeria

**PO3.20** Partial Oxidation of Methane to Methanol over Substituted Molybdeno-alkylsilicates of Keggin Type  
Sami Necrié, University M. Mammeri de Tiizi Ouzuz, Algeria

**PO3.21** Oxidative Dehydrogenation of Ethane over Mo-VTeNbO Catalysts  
Ole Swang, University of Oslo, Norway

**PO3.22** Oxidative Dehydrogenation of Methane to Methanol over Substituted Molybdeno-alkylsilicates of Keggin Type  
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**PO3.24** Oxidative Condensation of Methane to Ethylene over Mo/H2SM-5 Catalysts  
Erik Jan Ras, Atrium, The Netherlands

**PO3.25** Performance of a Dual Circulating fluidized Bed Reactor for the Mo/H2SM-5 Catalyzed Non-oxidative Methane Dehydroaromatization  
Zhanguo Zhang, National Institute of Advanced Industrial Science and Technology, Japan

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**TOPIC 4: ENERGY**

**PO4.01** Hydrogen Production by the Catalytic Partial Deoxidation of Propane  
Paul-Marie Marquaire, CNRS, France

**PO4.02** Hydrogen Production by the Catalytic Partial Deoxidation of Propane  
Paul-Marie Marquaire, CNRS, France

**PO4.03** Hydrogen Production by the Catalytic Partial Deoxidation of Propane  
Paul-Marie Marquaire, CNRS, France

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**PO4.04** Methane Oxidation over Iron-Ceria-zirconia Oxide  
Yanfeng Zhang, Shanghai Advanced Research Institute, China

**PO4.05** Steam Reforming of Methane at Low Temperature in an Electric field  
Tatsuya Shinagawa, Waseda University, Japan

**PO4.06** Liquid Compression Chemical Reactors  
Jose-Antonio Molto Barba, Instituto Tecnológico de Ciudad Madero, Mexico

**PO4.07** Propane Oxidation over Pt Catalysts Supported on various Aluminium Oxides with Different Crystalline Phases  
Klaus-Joachim Jens, Telemark University College, Norway

**PO4.08** Propane Oxidation over Pt Catalysts Supported on various Aluminium Oxides with Different Crystalline Phases  
Klaus-Joachim Jens, Telemark University College, Norway

**PO4.09** Propylene Oxidation over Pt Catalysts Supported on various Aluminium Oxides with Different Crystalline Phases  
Klaus-Joachim Jens, Telemark University College, Norway

**PO4.10** Propane Oxidation over Pt Catalysts Supported on various Aluminium Oxides with Different Crystalline Phases  
Klaus-Joachim Jens, Telemark University College, Norway

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**PO4.11** Conversion of Natural gas to Electrical Power by Direct Internal Reforming in Solid-Oxide Fuel Cells  
Klaus-Joachim Jens, Telemark University College, Norway

**PO4.12** Conversion of Natural gas to Electrical Power by Direct Internal Reforming in Solid-Oxide Fuel Cells  
Klaus-Joachim Jens, Telemark University College, Norway

**PO4.13** Conversion of Natural gas to Electrical Power by Direct Internal Reforming in Solid-Oxide Fuel Cells  
Klaus-Joachim Jens, Telemark University College, Norway

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**PO4.14** Methane Oxidation over Iron-Ceria-zirconia Oxide  
Yanfeng Zhang, Shanghai Advanced Research Institute, China

**PO4.15** Methane Oxidation over Iron-Ceria-zirconia Oxide  
Yanfeng Zhang, Shanghai Advanced Research Institute, China

**PO4.16** Methane Oxidation over Iron-Ceria-zirconia Oxide  
Yanfeng Zhang, Shanghai Advanced Research Institute, China

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**PO4.17** Methane Oxidation over Iron-Ceria-zirconia Oxide  
Yanfeng Zhang, Shanghai Advanced Research Institute, China

**PO4.18** Methane Oxidation over Iron-Ceria-zirconia Oxide  
Yanfeng Zhang, Shanghai Advanced Research Institute, China

**PO4.19** Methane Oxidation over Iron-Ceria-zirconia Oxide  
Yanfeng Zhang, Shanghai Advanced Research Institute, China

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**PO4.20** Methane Oxidation over Iron-Ceria-zirconia Oxide  
Yanfeng Zhang, Shanghai Advanced Research Institute, China

**PO4.21** Methane Oxidation over Iron-Ceria-zirconia Oxide  
Yanfeng Zhang, Shanghai Advanced Research Institute, China

**PO4.22** Methane Oxidation over Iron-Ceria-zirconia Oxide  
Yanfeng Zhang, Shanghai Advanced Research Institute, China
TRANSPORTATION SCHEDULE

CONFERENCE SHUTTLE SERVICE WILL RUN FROM
Retaj Al Rayan (A)
Movenpick Tower (B)
Renaissance Courtyard Hotel (C)
TO Ritz-Carlton Hotel (Conference Venue) (D), at the designated times [see Table below]

Shuttle buses will go to the same pick up and drop areas each day.

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<tr>
<td>D → A</td>
</tr>
<tr>
<td>B, C → D</td>
</tr>
<tr>
<td>D → B, C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SATURDAY, 2 MARCH, 2013 (DINNER AT THE AL-MOURJAN RESTAURANT (E))</th>
</tr>
</thead>
<tbody>
<tr>
<td>D → A*, B → E</td>
</tr>
<tr>
<td>E → A*, B → D</td>
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<tr>
<td>D → C → E</td>
</tr>
<tr>
<td>E → C → D</td>
</tr>
</tbody>
</table>

*A: Pick up and drop off for Movenpick guests will be in front of Retaj Al Rayan Hotel
*18.15: Bus departure from Ritz-Carlton front entrance

<table>
<thead>
<tr>
<th>SUNDAY, 3 MARCH, 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>A → D</td>
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<tr>
<td>B, C → D</td>
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<tr>
<td>D → A</td>
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<tr>
<td>B, C → D</td>
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<td>D → B, C</td>
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<table>
<thead>
<tr>
<th>WEDNESDAY, 6 MARCH, 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>A → D</td>
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<tr>
<td>B, C → D</td>
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<tr>
<td>D → A</td>
</tr>
<tr>
<td>B, C → D</td>
</tr>
<tr>
<td>D → B, C</td>
</tr>
</tbody>
</table>

TAXI CONTACT NUMBERS (Anticipate a 20 minute wait for taxi to arrive)

Fox transport  +974.4462.2777
Quick pick  +974.5541.0921
Speedy  +974.7018.3138
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