

第33回日本サウジアラビア合同シンポジウム

概要：

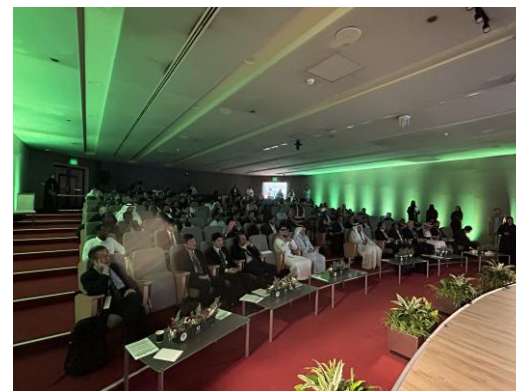
2025年2月10、11日の両日、サウジアラビア KFUPM Dhahran Techno Valley において、Saudi Aramco、KFUPM、JCCP、公益社団法人石油学会（JPI）の4社共催で「第33回日本サウジアラビア合同シンポジウム」を開催しました。初日のオープニングでは KFUPM Dr. Mohammad Al-Saggaf 学長、Saudi Aramco Dr. Faisal Al-Otaibi, Director, Research and Development Center、JCCP 増田常務理事、並びに JPI 片田副会長/鳥取大学教授が挨拶を行いました。170名を超える研究者や学生、現地日系企業からの出席を得て盛大なシンポジウムとなりました。シンポジウムのテーマは「燃料と石油化学における技術 - 持続可能なソリューションの推進」（Technology in Fuels & Petrochemicals: Advancing Sustainable Solutions）で、省エネ、AI や機械学習の適用、石油化学、持続可能エネルギーを分野に20件（内、日本から5件）の講演が行われました。またポスターセッションも実施され30件の発表があり、講演とともに活発な質疑応答等が交わされました。2025年、日本とサウジアラビア王国は、外交関係樹立70周年となる節目の年を迎え、本事業は周年記念事業として外務省に認定されています。



KFUPM学長 Dr. Mohammad Al-Saggaf



JCCP 増田常務理事



会場の様子



Dr. Faisal Al-Otaibi, サウジアラムコ Director,
Research and Development Center



JPI 片田副会長/鳥取大学教授

33rd Annual Saudi-Japan Symposium – 2025

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Technology in Fuels & Petrochemicals

Advancing Sustainable Solutions

Venue: KFUPM Dhahran Techno Valley, Innovation Cluster Bldg., Auditorium 1-111

February 10-11, 2025

Day One: Monday, February 10, 2025

OPENING REMARKS SESSION

Chairman: Dr. Wael Fouad, KFUPM

8:30 Opening Remarks

- Dr. Muhammad Al-Saggaf, President, KFUPM
- Mr. Hitoshi Masuda, Chief Technology Officer, Senior Executive Director, JCCP
- Dr. Faisal Al-Otaibi, Director, R&D Center, Saudi Aramco
- Dr. Naonobu Katada, Vice President, JPI

SESSION ONE WASTE-TO-CHEMICALS

Chairman: Dr. Takashi Toyao, Hokkaido Univ.

- 9:00 1. **Keynote:** Waste to sustainable aromatics, olefins and aviation fuels by zeolite-based catalysis; Prof. Konstantinos Triantafyllidis, CHEM, CRAC, KFUPM
- 9:30 2. Catalytic transformation of LDPE into fuel oil enriched with aromatic hydrocarbons; Dr. Muhammad Akthar, CRAC, KFUPM
- 9:50 3. Pyrolysis oil upgrading to aromatics; Dr. Miao Sun, Saudi Aramco
- 10:10 Coffee break

SESSION TWO SUSTAINABLE SOLUTIONS

Chairman: Dr. Shakeel Ahmed, KFUPM

- 10:40 4. Recycling of waste plastics without consumption of other materials: Shape selective cracking of polyolefin on H-MFI zeolite catalysts with recovery of cyclooctane solvent; Prof. Naonobu Katada, Tottori University
- 11:00 5. Kinetic influence of Ba on cobalt-catalyzed ammonia decomposition reaction; Dr. Zahra Almisbaa, Saudi Aramco
- 11:20 6. Sustainable passive solutions for reduced energy use in cooling applications; Dr. Issam Gereige, Saudi Aramco
- 11:40 Prayer & Lunch Break

SESSION THREE NEW CHALLENGES: PROCESSES/FUELS

Chairman: Dr. Faisal Alshafei, Saudi Aramco

- 13:00 7. Sustainability without borders: Advancing partnerships between the Kingdom of Saudi Arabia and Japan; Eng. Zainab Nasif and Ms. Ahaad Turki, OSP
- 13:30 8. North American market research: Energy transition to renewables from policies and technologies; Dr. Satoshi Ogano, JPI
- 13:50 9. Ultrasonically enhanced oxidative desulfurization of heavy fuel oil: Pilot scale test results and techno-economics assessment; Dr. Shekhar Kulkarni, KAUST
- 14:10 10. Catalysis reinvented: Sustainable materials and ultrafast laser insights for economic and environmental advancement; Dr. Ahmed El-Zohry; CIPR, KFUPM

14:35 - 15:50 Poster Session One (See Page 3)

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Day Two: Tuesday, February 11, 2025

SESSION FOUR ADVANCED CATALYST TECHNOLOGIES *Chairman: Dr. Naonobu Katada, JPI*

- 08:30 11. **Keynote:** Accelerated discovery of heterogeneous catalysts using machine learning; Dr. Takashi Toyao, Hokkaido University
- 09:00 12. Mechanochemical route to synthesize zeolites as novel method and their characterization with XAFS; Emeritus Prof. Atsushi Muramatsu, Tohoku University
- 09:20 13. Catalytic cracking technology for VGO application; Ms. Maryam Taher, Saudi Aramco
- 09:40 *Coffee Break*

SESSION FIVE SUSTAINABLE CHEMICALS *Chairman: Dr. Ziyauddin Qureshi, KFUPM*

- 10:10 14. **Keynote:** Rational design of heterogeneous catalyst for the production of sustainable chemicals; Dr. Javier Martinez, KAUST
- 10:40 15. Synergistic effects of S-C₃N₄ on cobalt ferrite catalysts for oxygen evolution reaction and enhanced electrochemical conversion of biomass derived 5-hydroxy-methylfurfural into 2,5-furandicarboxylic acid; Dr. Wasif Farooq, CHE, KFUPM
- 11:00 16. Tuning the properties of ZSM-5 additive for co-cracking of waste plastics dissolved in vacuum gas oil; Dr. Abdulkadir Tanimu, CRAC, KFUPM
- 11:20 17. Catalytic microwave assisted pyrolysis of waste plastics; Dr. Abdul Gani Abdul Jameel, CHE, KFUPM
- 11:40 *Prayer & Lunch Break*
- 13:00 - 14:15 *Poster Session Two (See Page 4)*

SESSION SIX CO₂ CAPTUR AND CONVERSION *Chairman: Dr. Rashed Aleisa, Saudi Aramco*

- 14:20 18. **Keynote:** Hydrogenation of CO₂ for carbon neutrality: Enhancing efficiency with membrane reactors; Prof. Masahiko Matsukata, Waseda University
- 14:50 19. Steering electrochemical CO₂ reduction toward liquid fuels and chemicals; Mr. Husain Naji, Saudi Aramco
- 15:10 20. Development of highly dispersed Pd nanoparticles supported on dendritic mesoporous heterogeneous catalyst for efficient CO₂ hydrogenation to methanol; Dr. Mohannad Alabsi, Saudi Aramco
- 15:30 *Closing Remarks, Symposium Ends*
Dr. Wael Fouad, CRAC, KFUPM

Each presentation includes 5-minutes Q&A

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POSTER SESSION ONE: MONDAY, FEBRUARY 10, 2025

Coordinator: Dr. Jaseer EA, KFUPM

- 14:35 P1. **Post-synthesis functionalization of covalent organic framework for CO₂ capture from DAC;** *Mona Al-Otaibi, Saudi Aramco*
- 14:40 P2. **DFT study of CO₂ hydrogenation over alumina-based catalysts via RWGS reaction;** *Abdulrahman Yassin, Saudi Aramco*
- 14:45 P3. **Enhancing hydrogen production: Acidic-basic structural modification of nickel-based catalysts for ammonia decomposition;** *Reem Albashrawi, Saudi Aramco*
- 14:50 P4. **Electrochemical ammonia decomposition over nickel and cobalt nanostructures on nickel foam for sustainable hydrogen production;** *Umar Jafar, Mustapha Umar, Yahaya Gambo, Khalid Alhooshani, Yousef Alsunni, CHEM, CHE, CRAC, KFUPM*
- 14:55 P5. **Maximizing CO production from CO₂ conversion for e-fuels: Reverse water-gas shift reaction;** *Emad Al-Shafei, Saudi Aramco*
- 15:00 P6. **Quantitative risk assessment of hydrogen refueling stations: A case study for Saudi Arabia;** *Bashir Hashim, Sunhwa Park, CHE, CRAC, KFUPM*
- 15:05 P7. **Selecting hydrogen storage in Saudi Arabia: A multi-criteria framework integrating FAHP for uncertainty and safety;** *YooJeong Oh, Hans Pasman, Safyan Khan, Sunhwa Park, CHE, CRAC, CHTC, KFUPM, Texas A&M USA*
- 15:10 P8. **Exploring the synergy between CoP and Co₂P phases: A comparative study of cobalt phosphides phases and their composite for hydrogen evolution reaction;** *Wajiha Fatima, Tarek Kandiel, CHEM, CHTC, KFUPM*
- 15:15 P9. **Decorating Zr₁₂O₁₂ nanocage with transition metals (Ti, V, Cr, or Mn) to act as a single-atom catalyst for water splitting application;** *Sajjad Hussain, Abdulaziz Al-Saadi, CHEM, CRAC, KFUPM*
- 15:20 P10. **Production of hydrogen and value-added chemicals through microwave assisted pyrolysis (MAP) of Arabian Crude Oils;** *Intisar Ul Hassan, Aniz Ummer, Abdul Gani Abdul Jameel, CHE, CRAC, KFUPM*
- 15:25 P11. **Dry reforming of methane to syngas using Ni/Al₂O₃ catalysts promoted by lanthanides;** *Imtiaz Ul Hasan, Zuhair Malaibari, Shakeel Ahmed, CHE, CRAC, KFUPM*
- 15:30 P12. **Catalytic performance in dry reforming of methane: A comparative study of SiO₂ encapsulated and unencapsulated Ni/Cao-Al₂O₃ catalysts;** *Sherif Alabi, Sagir Adamu, Abdallah Al-Shammari, Mohammad Hossain, CHE, CRAC, KFUPM*
- 15:35 P13. **Synthesis of ZSM-nonorods for low temperature CO₂ reforming of methane to syngas;** *Yahuza Abdulai, Ijaz Hussain, Khalid Alhooshani, Saheed Ganiyu, CHEM, CRAC, KFUPM*
- 15:40 P14. **Case study on the acid sites formation and morphology in amorphous silica-alumina;** *Batool Altaher, Saudi Aramco*
- 15:45 P15. **Exploring zeolite potential for hydrofluorocarbon capture and recycling: Insights from molecular simulations;** *Abrar Elhussien, Ismail Abdulazeez, Hassan Alasiri, Wael Fouad, CHE, CMWS, CRAC, KFUPM*

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POSTER SESSION TWO: TUESDAY, FEBRUARY 11, 2025

Coordinator: Dr. Jaseer EA, KFUPM

- 13:00 P16. A novel approach for the synthesis of carbon fiber from low-value heavy petroleum fractions; *Ajay Sharma, Mustafa Amin, Muhammad Siddiquee, CHE, CRAC, KFUPM*
- 13:05 P17. Gen2 hydrocracking catalyst development for thermal crude to chemicals; *Lianhui Ding, Saudi Aramco*
- 13:10 P18. Hierarchical ZSM-11: A catalyst for converting crude oil into light olefins; *Muhammad Waqas, Ziyauddin Qureshi, CRAC, KFUPM*
- 13:15 P19. Co-pyrolysis of microalgae and plastic waste into valuable products; *Fatima AlRadhi, Ahmad Nawaz, Shahina Riaz, Shaikh Abdur Razzak, Omar Abdelaziz, CHE, CRAC, KFUPM*
- 13:20 P20. Experimental investigation of co-pyrolysis of plastic waste and biomass: Biofuel production and comprehensive characterization; *Hayat Haddad, Ahmad Nawaz, Shaikh Abdul Razak, CHE, CRAC, KFUPM*
- 13:25 P21. Conversion of polypropylene to chemicals in a reactive distillation system; *Kagiso Bikane, Jingyang Bai, Marcos Millan, CHE, CRAC, KFUPM, ICL, UK*
- 13:30 P22. Ensemble technique for predicting dehydrogenation products yield during *n*-butane oxidative dehydrogenation; *Gazali Tanimu, Jimoh Ajadi, Hassan Alasiri; CRAC, CHE, MATH, KFUPM*
- 13:35 P23. Rational design of N-aryl PNP ligands for controlling product profiles in Cr-catalyzed ethylene oligomerization; *Abdulrahman Musa, E. A. Jaseer, Samir Barman, Nestor Garcia, Mohamed Elanany; Motaz Khawaji, CRAC, CHEM, KFUPM, Saudi Aramco*
- 13:40 P24. Mesoporosity engineering in zeolites for enhanced catalytic performance: Post-synthesis modification and adsorption study; *Nida Tasneem, Hassan Alasiri, Shakeel Ahmed, CHE, CRAC, KFUPM*
- 13:45 P25. A lumped kinetic model for hydro-dearylation process; *Qi Xu, Saudi Aramco*
- 13:50 P26. Development of tin-containing mesoporous silica catalysts for Baeyer-Villager oxidation of cyclic ketones; *Mashail Al-Qahtani, Saudi Aramco*
- 13:55 P27. Efficient synthesis of dimethyl carbonate from CO₂ using cerium oxide-based catalysts; *Niladri Maity, CRAC, KFUPM*
- 14:00 P28. Single-step electrochemical conversion of CO₂ to C₄ products with Cu based catalyst unveiling mechanisms through DFT and in situ Raman spectroscopy; *Esraa Kotob, Khalid Alhooshani, Saheed Ganiyu, CHEM, CRAC, KFUPM*
- 14:05 P29. Synergistic role of La and Ni species on CeO₂ decorated SiO₂ catalyst for enhanced CO₂ conversion to synthetic natural gas (SNG); *Ijaz Hussain, Saheed Ganiyu, Khalid Alhooshani, CHEM, CRAC, KFUPM*
- 14:10 P30. Carbon nitride modified highly reduced graphene composite as a potential material for CO₂ utilization: insights from first-principle DFT calculations; *Abdulraheem Bello, Abdulaziz Al-Saadi, CHEM, CRAC, KFUPM*