

Qi Sun

Director of Catalysis R&D Center at NICE, Head of Institute for Sustainable Energy and Resources at Qingdao Univ,;

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Willing to relocate: Anywhere

Work Experience

Chief Professor and Head of Sustainable Energy and Resources

Qingdao University - Qingdao, China

December 2019 to Present

- Fund raising for research and laboratory construction
- Established a feasible innovation mechanism for promoting the cooperation between university and industries on research and technology transforming and application.
- Established a cooperation platform for university and multi-companies.
- Focused on nano metallic and porous materials development and applications for olefins and syngas science and technology, H₂O₂ synthesis, H₂ energy and VOCs catalytic combustion and chemicals separation.
- Focused on industrial waste utilization by extracting or conversion to make high-ed products.
- Commercialized novel multi-functional wide-temperature SCR catalyst, SCR regeneration and recycling technologies.

Director of Catalysis R&D, Director of the technology platform

National Institute of Clean-and-low-carbon Energy

October 2009 to December 2019

- Co-founder of NICE and built up research team, developed strategy and technology portfolio.
- Designed and initiated coal chemical technology road map, Raised funds and managed expenditure of RD and logistics.
- Breakthrough achievement made in following areas:
 - Methanol to Olefins catalyst development and commercialization - commercialized in 2013 and a high performance MTO catalyst developed and a novel process is in demonstration.
 - Developed a novel coal to SNG process and catalysts -- Pilot plant testing finished.
 - Developed catalyst and process for acetic acid hydrogenation to ethanol synthesis - being industrialized with China Yankuang group.
 - As PI, led the National Key Program "coal combusted power plant waste control and utilization", developed a novel technology for fly ash utilization (converted ultra clear glass, Al₂O₃ and zeolites etc.) - Finished industrial demonstration plant construction and long-term operation.
 - Initiated and developed novel waste water treatment, CO₂ capture, CO₂ photocatalytic conversion technologies etc.
 - Initiated and led SCR catalyst life cycle management® technology development and designed the business model and industrialization pathway. At present, the SCR catalyst regeneration and recovery

technology, SCR catalyst life cycle management technology, novel wide-temperature window SCR catalysts have all been industrialized (covering 60% of China's market).

> Initiated and led the R&D of syngas conversion strategy (to light olefins and aromatics) and methanol synthesis technology (including WGS catalyst, methanol synthesis catalyst and process); The catalysts are being commercialized.

Senior principal scientist, Responsible for Olefins Technology

LyondellBasell Industries

October 2005 to October 2009

- Responsible for the company's technology development and optimization of olefins production and olefin conversion technologies, including olefin purification, vinyl acetate synthesis, isomerization, aromatics separation and toluene disproportionation, and separation of high-purity isoprene monomers; Participated in propylene advanced epoxidation technology, propylene carbonylation synthesis of butanol, ultra-low sulfur diesel production, etc.
- Established research and industrial implementation platform for olefin purification and catalysts development capability (team, lab and pilot test units, catalyst synthesis lab and process analysis).
- Based on the mechanism of acetylene and ethylene hydrogenation and other side reactions, I have developed a novel catalyst regeneration technology, which made the regenerated catalysts are better than the fresh catalysts (commercialized and made great savings for the company).
- Led the implementation of process/operation modifications and catalyst optimization for seven olefin plants around the world - transformed the troublesome olefins operation to the most reliable and efficient operation, and increased Lyondell's olefins profit/savings over hundreds of million dollars every year.
- Developed the collaboration with external resources in hydrogenation, aromatics isomerization and olefin purification catalysts development, including proposed collaboration mode with King Abdula University of Saudi Arabia (KAUST) and leveraged the cooperation with Saudi Arabia for a strategic investment opportunity.
- Responsible for assessing the process economics and technical analysis and risks of underground coal gasification in Australia and coal chemical projects in Italy.

Senior Chemist/ R&D manager

Süd-Chemie Inc - Louisville, KY

May 2001 to October 2005

- Led petrochemical catalyst R&D team and activities, including development, manufacturing of olefins (C₂= - C₅=) selective hydrogenation catalysts, pygas C₂= selective hydrogenation - Solo investigator of the fundamental catalytic theory of olefins SH catalyst and guided the development of the outstanding Olemax-207 catalyst, which is a revolutionary breakthrough on C₂= SH performance.
- Developed/improved catalysts for MAPD, butadiene selective hydrogenation,

2003.05~2005.10: Senior Chemist, Süd-Chemie Inc., Louisville, KY

- Responsible for toluene disproportionation, refinery hydrogenation catalysts and process development and applications.
- Developed robust Ni/SiO₂ sulfur tolerant hydrogenation catalyst, which played important role in improving company performance.
- Developed catalysts for xylene isomerization, toluene disproportionation and transalkylation of heavy reformates.

Post-doc

Center for Catalysis, Northwestern University - Evanston, IL

December 1999 to October 2001

with Professor Wolfgang M. H. Sachtler)

- Developed novel metal (Fe, Cu, Co, Pd, Au)/zeolite catalysts for selective catalytic reduction (SCR) of NO_x
- Investigated the catalytic process and mechanism of catalytic reduction (SCR) of NO_x (DeNO_x) by ammonia/hydrocarbons
- Investigated the catalytic process and reaction mechanisms of partial oxidation of ethylene/benzene to ethylene oxide/phenol

Post-doc

Caltech - Pasadena, CA

June 1998 to December 1999

with Professor George R. Gavalas)

- Investigated catalytic process of natural gas conversion to aromatics and olefins
- Synthesized and characterized various carbon materials and catalyst for natural gas conversion

Assistant/Associate Professor

Department of Chemistry, Fudan University - Shanghai, CN

August 1996 to June 1998

China

- Green catalytic process study: CO₂ direct reduction and conversion to methanol using nano- composite catalysts
- Membrane separation and membrane catalysis with various inorganic catalytic membranes and membrane reactors, i.e. Pd, Pt-Al₂O₃/ceramic membrane

Research Assistant, Department of Chemistry

Fudan University - Shanghai, CN

September 1993 to July 1996

- Invented novel synthesis methodologies for ultrafine aerogel and nano-catalysts
- Developed nano Cu-based catalyst for CO₂ hydrogenation to methanol

Membership and Social Membership (Professional Memberships)

- Executive Chairman of the Philadelphia Catalysis Society
- Member of the American Chemical Society
- Member of the American Chemical Engineering Society
- Director of the North American Catalysis Society
- Senior Research Fellow, China Energy Society
- Vice President of China Association of Circular Economics
- Director of the Beijing Energy Society
- Vice Chairman of the Inner Mongolia Solid Waste Industry Alliance
- Vice President of Beijing Energy and Environment Society

Education

Executive MBA in Entrepreneurship and Market Development

Drexel University - Philadelphia, PA

Post-doc in Research

Center for Catalysis Research, Northwestern University - Evanston, IL

post-doc in Chemical Engineering

California Institute of Technology - Pasadena, CA

Ph.D.

Fudan University - Shanghai, CN