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Academic Profile

Prof Xu Rong

Interim Chair, School of Chemical and Biomedical Engineering
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Education

- PhD National University of Singapore 2004
- MEng National University of Singapore 2000
- BEng(Hons) National University of Singapore 1998

Biography

Dr. Rong Xu is a Professor in the School of Chemical & Biomedical Engineering. She studied Chemical Engineering at the National University of Singapore. She received her Bachelor degree (1st Class) in 1998, Master degree in 2000 and Ph.D. degree in 2004 under the supervision of Professor Hua Chun Zeng. In the same year she joined Nanyang Technological University in Singapore as an Assistant Professor and was promoted to Associate Professor in 2010. She served as Associate Chair (Research) during 2011-2014. Currently she is the Interim Chair of the School since 1 Jul 2017.

Her research group has been actively involved in areas related to energy and environmental applications including solar fuel generation and water treatment. One of her research focuses is the development of nano-engineered particulate semiconductor photocatalysts, molecular complexes and hybrid systems for conversion of solar energy to chemical energy via photocatalytic water splitting and carbon dioxide reduction to hydrocarbons and oxygenates. Her group designs efficient inorganic co-catalysts and metal complex catalysts with appropriate interface with the photosensitizers to achieve efficient light absorption, charge separation and utilization. She has completed several projects in these areas as PI with a total value of more than S$5 million from funding agencies such as Agency for Science, Technology & Research (A-Star), Ministry of Education, National Environmental Agency. Currently her work is funded by National Research Foundation through the CREATE Programmes and ExxonMobil Research and Engineering Company. To date, she has published over 140 papers in top tier journals including Advanced Materials, Science Advances, Energy & Environmental Sciences, Journal of the American Chemical Society, ACS Nano, etc. She received Top-Cited Papers for 2010 and 2011 Award from Elsevier, New York, USA for her paper on supported cobalt oxide catalysts for water treatment published in Applied Catalysis B: Environmental. She is currently an Associate Editor the Beilstein Journal of Nanotechnology.

Research Interests

- Photocatalysis for reduction of carbon dioxide and hydrogen production by splitting water using visible light.
- Heterogeneous catalysis for environmental applications.
- Organic-inorganic layered materials (LDHs) for pharmaceutical applications.
- Development of artificial cornea (nanoparticle/polymer composite).
- Antimicrobial membrane for water treatment (Silver in microfiltration membrane).
- Immobilization of enzymes on inorganic solid support as scalable and reusable biocatalysts.

Current Projects

- A table top chemical factory for the reduction of CO2 to value added chemicals

- Cambridge Centre for Carbon Reduction in Chemical Technology (C4T) - Carbon Abatement in the Petroleum Refining Industry: A Control and Optimisation Research Network (CAPRICON) (IRP3.3)
- Capacitative protein sorting for facile regeneration of a protein sorting adsorption system
- Development of advanced functional materials and solutions for energy and environmental applications
- Novel Photo/Electro-catalysts for Energy Applications
- Novel silver nanoparticle/Multi-walled carbon nanotube nanohybrid coating for disinfection and biofouling control in drinking water treatment
- School of Chemical and Biomedical Engineering – Cat8 EOM
- Synthesis and Surface Functionalization of Carbon Materials and Related Composite Materials for Catalysis and Separations in Petroleum and Natural Gas Industries
- Z-scheme Artificial Photosynthesis for the Generation of Renewable Fuel

Selected Publications

- Zhang, W., Wang, Y. B., Wang, Z., Zhong, Z. Y., Xu, R.*. (2010). Highly Efficient and Noble Metal-Free NiS/CdS Photocatalysts for Hydrogen Evolution from Lactic Acid Sacrificial Solution under Visible Light. *Chemical Communications, 46*, 7631-7633.
- Zhang, W., Tay, H. L., Lim, S. S., Wang, Y. S., Zhong, Z. Y., Xu, R.*. (2010). Supported cobalt oxide on MgO: highly efficient catalysts for degradation of organic dyes in dilute solutions. *Applied Catalysis B: Environmental, 95*, 93-99.
- Gunawan, P. and Xu, R.*. (2009). Direct Assembly of Anisotropic Layered Double Hydroxide (LDH) Nanocrystals on Spherical Template for Fabrication of Drug-LDH Hollow Nanospheres. *Chemistry of Materials, 21*, 781-783.
- Xu Rong.(2009). Development of nanoceramic oxides and their applications in heterogeneous catalysis. In Tseng, T.Y. and Nalwa, H.S.(Ed), *Handbook of nanoceramics and their based devices*(301-344). American Scientific Publishers.
- Zhang, W., and Xu, R.*. (2009). Surface Engineered Active Photocatalysts without Noble Metals: CuS-ZnxCd1-xS Nanospheres by One-Step Synthesis. *International Journal of Hydrogen Energy, 34*, 8495-8503.

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