Jing Zhang

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Profile

2020.5-present, East China University of Science and Technology, United Laboratory of Chemical Reaction Engineering, Deputy director
2019.7-present, East China University of Science and Technology, Department of Chemical Engineering, Professor
2015.3-2019.6, University of Colorado Boulder, Department of Chemical and Biological Engineering, Postdoctoral Research Associate with Dr. James W. Medlin
2015.1-2015.3, Iowa State University, Department of Chemical and Biological Engineering, Postdoctoral Research Associate with Dr. Brent H. Shanks
2010.8-2014.12, Iowa State University, Department of Chemical and Biological Engineering, Ph.D., Advisor: Dr. Brent H. Shanks
2007.9-2010.3, East China University of Science and Technology, Department of Chemical Engineering, Master, Advisor: Professor Xinggui Zhou
2003.9-2007.6, East China University of Science and Technology, Department of Chemical Engineering, Bachelor

Research Field

Catalytic conversion of carbon based resources and process intensification
1. Catalytic conversion of plastic waste, biomass, and CO2 into fuels and value-added chemicals
We are particularly focused on interfacial chemistry important in the conversion of plastic/biomass/CO2 to fuels and chemicals. These carbon resources contain a high degree of C-C/C-O bonds, and it is a major challenge to develop new catalysts capable of selective conversions of these C-C/C-O bonds for production of fuel and value-added chemicals. A major focus of our group is to design such catalysts based on a molecular-scale understanding of the catalytic depolymerization/deoxygenation process by investigating reaction kinetics and transport phenomenon.
2. Production of new functional materials and fine chemicals via microfluidics
Microchemical technology has the advantages of high efficiency of heat and mass transfer and easy scale-up, which is especially suitable for fast and highly exothermic reaction process. We aim at revealing scale effect and interfacial effect, dynamic behavior of flow and interface under micro-reaction environment, the coupling between transfer and reaction, as well as the parallel numbering-up law and system integration technology in microreactors.

Research results and main published thesis

[1].Jing Zhang; Lucas D. Ellis; Bingwen Wang; Michael J. Dzara; Carsten Sievers; Svitlana Pylypenko; Eranda Nikolla; J. Will Medlin*; Control of interfacial acid–metal catalysis with organic monolayers, Nature Catalysis, 2018, 1: 148-155.
[2].Jing Zhang; Shyam Deo; Michael J Janik; J Will Medlin*; Control of molecular bonding strength on metal catalysts with organic monolayers for CO2 reduction, Journal of the American Chemical Society, 2020, 142: 5184-5193.
[3].Jing Zhang#; Bingwen Wang#; Eranda Nikolla*; J. Will Medlin*; Directing Reaction Pathways through Controlled Reactant Binding at Pd-TiO2 Interfaces, Angewandte Chemie, 2017, 129: 6694-6698.
[4].Jing Zhang; J. Will Medlin*; Catalyst design using an inverse strategy: From mechanistic studies on inverted model catalysts to applications of oxide-coated metal nanoparticles, Surface Science Reports, 2018, 73: 117-152.
[5].Jing Zhang; Kaige Wang; Michael W Nolte; Yong S Choi; Robert C Brown; Brent H Shanks*; Catalytic deoxygenation of bio-oil model compounds over acid-base bifunctional catalysts, ACS Catalysis, 2016, 6: 2608-2621.
[6]Zhirong Yang; Yue Yang; Xuefeng Zhang; Jing Zhang*; Gang Qian; Xuezhi Duan; Xinggui Zhou*; High-yield production of p-diethynylbenzene through consecutive bromination/dehydrobromination in a microreactor system, AIChE Journal, 2021, doi: 10.1002/aic.17498.