



Weizhong Zheng

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Professional field: Chemical Engineering and Technology
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Profile

- 2022.07-Now East China university of Science and Technology, School of Chemical Engineering, Distinguished Researcher
- 2020.01-2022.06 East China university of Science and Technology, School of Chemical Engineering, Chemical Engineering and Technology, Postdoctoral Fellow, Collaborating Mentor: Qian Feng
- 2014.09-2019.12 East China university of Science and Technology, School of Chemical Engineering, Chemical Engineering and Technology, Doctor, Mentors: Zhao Ling and Sun Weizhen
- 2018.09-2019.09 Stanford University, Chemistry, Visiting PhD student, Collaborating Mentor: Michael D. Fayer
- 2010.09-2014.06 East China university of Science and Technology, School of Chemical Engineering, Chemical Engineering and Technology, Batcher

Research Field

Engaged in the research fields of interfacial microenvironment control and the structure-performance relationships. Addressing the strategic needs of green, low-carbon, and high-value development in chemical processes and products, the fundamental research and application is focused on to elucidate the key issues related to interface microenvironment control and the enhancement of reaction/mass transfer processes in complex chemical systems by utilizing advanced characterization techniques and theoretical computations:

1. Identification and Enhancement of Interfacial Properties in Liquid-Liquid (Solid) Systems:

- Identification and control mechanisms of interfacial structure, reactions, and transport properties.
- Establishment of structure-property-performance relationships at the interface.
- High-throughput screening and rational design of novel media (catalysts and solvents).
- Coupling control of reaction and mass transfer, and process intensification.

2. Identification and Enhancement of Interfacial Properties in Polymer Systems:

- Recognition of complex reactions, transport, and dissolution-swelling patterns.
- Design of new media (catalysts and solvents) and process optimization.
- Control of depolymerization reactions and mass transfer.
- Development of innovative strategies for the high-value utilization of waste polymers.

Research results and main published thesis

Published over 40 SCI papers with about 30 papers as the first or corresponding author, including J Am Chem Soc, AIChE J (5), Chem Eng Sci (7), Chem Eng J(2), Ind Eng Chem Res (3), ACS Catal, ACS Nano, ACS Appl. Energy Mater, Fuel, JPCC, JPCB(2). Applied for 9 patents, of which 3 have been granted. Recognized with awards such as the CPCIF-Clariant Sustainable Development Young Innovation Award from the China Petroleum and Chemical Industry Federation (CPCIF), Chemical Engineering and Materials Jingbo Doctoral Thesis Award.

1. Zheng W#, Yamada SA#, Hung ST, Sun W, Zhao L, Fayer MD. Enhanced Menshutkin SN2 Reactivity in Mesoporous Silica: The Influence of Surface Catalysis and Confinement. *Journal of the American Chemical Society*, 2020, 142(12):5636-5648.
2. Ma, Z., Zheng, W.*, Sun, W.*, Zhao, L. Enhanced catalytic performance of H2SO4-catalyzed C4 alkylation by formyl functional [N1, 1, 1, 1][C10SO4] additive. *AIChE Journal*, 2023, e18179.
3. Zheng, W., Ma, Z., Sun, W., Zhao, L. Target high-efficiency ionic liquids to promote H2SO4-catalyzed C4 alkylation by machine learning. *AIChE Journal*, 2022, 68(7), e17698.
4. Ma, Z., Sha, J., Zheng, W.*, Sun, W.*, Zhao, L. Effects of deep eutectic solvents on H2SO4-catalyzed alkylation: Combining experiment and molecular dynamics simulation. *AIChE Journal*, 2022, 68(4), e17556.
5. Zheng W, Wang Z, Sun W, Zhao L, Qian F. H2SO4-catalyzed isobutane alkylation under low temperatures promoted by long-alkyl-chain surfactant additives. *AIChE Journal*. 2021,67(10):e17349.
6. Zheng W, Sun W, Zhao L et al. Understanding Interfacial Behaviors of Isobutane Alkylation with C4 Olefin Catalyzed by Sulfuric Acid or Ionic Liquids. *AIChE Journal*, 2018, 64(3): 950-960.
7. Zheng W#, Liu C#, Wei X, et al. Molecular-level swelling behaviors of poly (ethylene terephthalate) glycolysis using ionic liquids as catalyst. *Chemical Engineering Science*, 2023, 267: 118329.
8. Liu C, Ling Y, Wang Z, Zheng W*, Sun W*, Zhao L. Unveiling the microenvironments between ionic liquids and methanol for alcoholysis of poly (ethylene terephthalate). *Chemical Engineering Science*. 2022, 247:117024.
9. Zheng W, Sun W, Zhao L, Qian F. Modeling the solid/liquid interfacial properties of methylimidazole confined in hydrophobic silica nanopores. *Chemical Engineering Science*. 2021, 231:116333.
10. Zheng W, Sun W, Zhao L et al. Towards an Understanding of the Microstructure and Interfacial Properties of the Ionic Liquid/Sulfuric Acid Catalyst in Liquid-liquid Reactions. *Chemical Engineering Science*, 2019, 205:287-298.
11. Zheng W#, Cao Piao#, Sun W, Zhao L et al. Experimental and modeling study of isobutane alkylation with C4 olefin catalyzed by Brønsted acidic ionic liquid/sulfuric acid. *Chemical Engineering Journal*. 2019, 377:119578.
12. Zheng W, Sun W, Zhao L et al. Multi-scale modeling of isobutane alkylation with 2-butene using composite ionic liquids as catalyst. *Chemical Engineering Science*, 2018, 186: 209-218.
13. Zheng W, Sun W, Zhao L et al. Screening of Imidazolium Ionic Liquids for the Isobutane Alkylation Based on Molecular Dynamic Simulation. *Chemical Engineering Science*, 2018, 183: 115-122.
14. Zheng W, Sun W, Zhao L et al. Modeling of the interfacial behaviors for the isobutane alkylation with C4 olefin using ionic liquid as catalyst. *Chemical Engineering Science*, 2017, 166: 42-52.
15. Zheng W, Sun W, Zhao L et al. Controllable Preparation of Nanoscale Metal-Organic Frameworks by Ionic Liquid Microemulsions. *Industrial & Engineering Chemistry Research*, 2017, 56(20): 5899-5905.
16. Zheng W, Zhao L, Sun W, Qian F. Understanding the Confinement Effects and Dynamics of Methylimidazole in Nanoscale Silica Pores. *The Journal of Physical Chemistry C*. 2021, 125(13):7421-7430.
17. Wang Z#, Zheng W#, Li B, et al. Confined ionic liquids in covalent organic frameworks toward the rational design of high-safety lithium metal battery. *Chemical Engineering Journal*, 2022, 433: 133749.