



Minghui Zhu

Department: School of Chemical Engineering
Professional field: Chemical Engineering and Technology
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Profile

September 2018 - Present, East China University of Science and Technology, School of Chemical Engineering, Principal investigator

May 2017 - August 2018, Massachusetts Institute of Technology, Department of Chemical Engineering, Postdoctoral Associate, Collaborating with Professor Karthish Manthiram

August 2011 - December 2016, Lehigh University, Chemical Engineering, PhD, Advised by Professor Israel E. Wachs

September 2007 - June 2011, Zhejiang University, Chemical Engineering and Technology, Bachelor's Degree

Research Field

1. Low-Carbon Energy Chemical Engineering (Hydrogen production through methanol and methane reforming, water-gas shift reaction, carbon dioxide hydrogenation to synthesize methane and methanol)

2. Dynamic In Situ Characterization and Regulation of Industrial Catalysts (In situ reactor design and development, dynamic analysis of catalyst interfaces, spectroscopic analysis assisted by machine learning)

Research results and main published thesis

Published a total of 95 SCI-indexed papers with over 4000 citations; in the past five years, authored or co-authored 50 papers as the first or corresponding author in prestigious journals including Nat. Catal., AIChE J., Angew. Chem. Int. Ed., J. Am. Chem. Soc., Energy Environ. Sci., ACS Catal., Appl. Catal. B: Environ., etc. Filed 13 patents for Chinese national inventions, of which 5 have been granted. The research achievements were honored with the Second Prize in Basic Research by the Chinese Chemical Society Science and Technology Award in 2020. Recognized by national accolades, including the National Young Talents Program, the Young Talents Support Project by the Association for Science and Technology, the "Thousand Talents Plan" Distinguished Professor in Shanghai, and the Shanghai Universities Special Appointed Professor (Eastern Scholar).

1. Didi Li; Fang Xu; Xuan Tang; Sheng Dai; Tiancheng Pu; Xianglin Liu; Pengfei Tian; Fuzhen Xuan; Zhi Xu; Israel E. Wachs; Minghui Zhu; Induced Activation of the Commercial Cu/ZnO/Al₂O₃ Catalyst for the Steam Reforming of Methanol, *Nature Catalysis*, 2022, 5: 99-108

2. Shiqing Jin; Zekai Zhang; Didi Li; Yiming Wang; Cheng Lian; Minghui Zhu; Alcohol-Induced Strong Metal-Support Interactions in a Supported Copper/ZnO Catalyst, *Angewandte Chemie International Edition*, DOI: 10.1002/anie.202301563, 2023

3. Minghui Zhu; Jiacheng Chen; Libei Huang; Ruquan Ye; Jing Xu; Yi-Fan Han; Covalently Grafting Cobalt Porphyrin onto Carbon Nanotubes for Efficient CO₂ Electroreduction, *Angewandte Chemie International Edition*, 2019, 58: 6595-6599

4. Minghui Zhu; Pengfei Tian; Ravi Kurtz; Thomas Lunkenbein; Jing Xu; Robert Schlögl; Israel E. Wachs; Yi-Fan Han; Strong Metal-Support Interactions between Copper and Iron Oxide during the High-Temperature Water-Gas Shift Reaction, *Angewandte Chemie International Edition*, 2019, 58: 9083-9087

5. Minghui Zhu; Pengfei Tian; Jiacheng Chen; Michael E. Ford; Jing Xu; Israel E. Wachs; Yi-Fan Han; Activation and Deactivation of the Commercial-Type CuO-Cr₂O₃-Fe₂O₃ High Temperature Shift Catalyst, *AIChE Journal*, 2020, 66: e16846

6. Minghui Zhu; Jun-Kun Lai; Uma Tumuluri; Zili Wu; Israel E. Wachs; Nature of Active Sites and Surface Intermediates during SCR of NO with NH₃ by Supported V₂O₅-WO₃/TiO₂ Catalysts, *Journal of the American Chemical Society*, 2017, 139: 15624-15627

7. Tiancheng Pu; Wenhao Zhang; Minghui Zhu; Engineering Heterogeneous Catalysis with Strong Metal-Support Interactions: Characterization, Theory and Manipulation, *Angewandte Chemie International Edition*, 2022, 62(4): e202212278

8. Xinyu Cao; Tiancheng Pu; Bar Mosevitzky Lis; Israel E. Wachs; Chong Peng; Minghui Zhu; Yongkang Hu; Controlling the Reconstruction of Ni/CeO₂ Catalyst during Reduction for Enhanced CO Methanation, *Engineering*, 2022, 14: 94-99

9. Tiancheng Pu; Liang Shen; Jing Xu; Chong Peng; Minghui Zhu; Revealing the Dependence of CO₂ Activation on Hydrogen Dissociation Ability over Supported Nickel Catalysts, *AIChE Journal*, 2022, 68(1): e17458

10. Minghui Zhu; Ruquan Ye; Kyoungsuk Jin; Nikifar Lazouski; Karthish Manthiram; Elucidating the reactivity and mechanism of CO₂ electroreduction at highly dispersed cobalt phthalocyanine, *ACS Energy Letters*, 2018, 3: 1381-1386

11. Xiaohan Yuan; Tiancheng Pu; Mengwei Gu; Minghui Zhu; Jing Xu; Strong Metal-Support Interactions between Nickel and Iron Oxide during CO₂ Hydrogenation, *ACS Catalysis*, 2021, 11: 11966-11972

12. Mengwei Gu; Sheng Dai; Runfa Qiu; Michael E. Ford; Chenxi Cao; Israel E. Wachs; Minghui Zhu; Structure-Activity Relationships of Copper- and Potassium-Modified Iron Oxide Catalysts during Reverse Water-Gas Shift Reaction, *ACS Catalysis*, 2021, 11: 12609-12619

13. Minghui Zhu; Pengfei Tian; Michael E. Ford; Jiacheng Chen; Jing Xu; Yi-Fan Han; Israel E. Wachs; Nature of Reactive Oxygen Intermediates on Copper-Promoted Iron-Chromium Oxide Catalysts during CO₂ Activation, *ACS Catalysis*, 2020, 10: 7857-7863

14. Liang Shen; Jing Xu; Minghui Zhu; Yi-Fan Han; Essential Role of the Support for Nickel-Based CO₂ Methanation Catalysts, *ACS Catalysis*, 2020, 10: 14581-14591

15. Minghui Zhu; Jun-Kun Lai; Uma Tumuluri; Michael E. Ford; Zili Wu; Israel E. Wachs; Reaction Pathways and Kinetics for Selective Catalytic Reduction (SCR) of Acidic NO_x Emissions from Power Plants with NH₃, *ACS Catalysis*, 2017, 7: 8358-8361