

Biographical Sketch

Zili Wu



Education/Training:

Wuhan University, Wuhan, China	B.S.	1996	Environmental Chemistry
Dalian Institute of Chemical Physics, Dalian, China.	Ph.D.	2001	Physical Chemistry
Northwestern University, Evanston, IL	Postdoc	2006	Physical Chemistry

Research and Professional Experience:

2016 – present	Group Leader of Surface Chemistry and Catalysis at CSD of ORNL
2020 – 2023	Acting Section Head of Chemical Transformations at Chemical Sciences Division (CSD), ORNL
2006 – present	R&D associate, staff, senior and Distinguished staff of Chemical Sciences Division (CSD) and Center for Nanophase Materials Sciences (CNMS), ORNL

Research Interests:

- Heterogeneous catalysis, photocatalysis, plasma catalysis;
- Surface chemistry, reaction mechanisms and kinetics via *in situ/operando* spectroscopy including IR, Raman, neutron scattering;
- Well-defined nanocatalysts including oxides, supported metals and 2D materials;
- Natural gas conversion, CO₂ conversion, biomass conversion and water splitting.
- **Key Words:** heterogeneous catalysis, photo(electro)catalysis, *in situ/operando* spectroscopy, complex oxide catalysts, metal catalysts, 2D materials.

Synergistic Activities:

- **PI of multiple projects** (~\$4 million per year) from fundamental catalysis to applied catalysis at ORNL.
- **Deputy Director** of NEETER Energy EarthShot Research Center (EERC) of DOE SC (2023-2027); **Thrust Leader** of UNCAGE-ME EFRC of DOE-BES (2014 – 2026).
- **Editorial Board:** Catalysis Today, 2023 – present; Chinese Journal of Catalysis, 2014 – present; Chinese Chemical Letters, 2016 – present.
- **International Scientific Committee** of *Fundamentals and Applications of Cerium Oxide in Catalysis*, 2018, 2020, 2024.
- **Symposium organizers:** >15 symposia at ACS National Meetings, MRS Meeting and AVS Meeting.
- **Advisory Committees:** Northwestern University, External Advisory Board of Institute of Catalysis for Energy Processes (2017 – 2023)
- **Advisor** of ~17 postdocs and 5 graduate students

Awards

2023 ORNL Outstanding Research Output Team Award;
2020 ORNL-CNMS Outstanding S&T Accomplishment Award;
2019 Excellence in Catalysis Award from the Catalysis Society of Metropolitan New York.

Selected list of publications (Total over 250, H-index 71, Google scholar:

https://scholar.google.com/citations?hl=en&user=tyqZrsYAAAAAJ&view_op=list_works)

1. He, Y.; Li, Y.; Lei, M.; Polo-Garzon, F.; Perez-Aguilar, J.; Bare, S. R.; Formo, E.; Kim, H.; Daemen, L.; Cheng, Y.; Hong, K.; Chi, M.; Jiang, D.-e.; Wu, Z., Significant Roles of Surface Hydrides in Enhancing the Performance of Cu/BaTiO₂.8H₂O Catalyst for CO₂ Hydrogenation to Methanol. *Angewandte Chemie International Edition* **2024**, *63* (1), e202313389.
2. Wu, Y.; Li, Y.; Yu, X.; Ma, X.; Boebinger, M.; Weber, J.; Wu, Z., Insights into size effects of Pt/Al₂O₃ catalysts on hydrogen production from methylcyclohexane dehydrogenation. *Catalysis Science & Technology* **2024**. DOI: 10.1039/D3CY01568H.
3. He, Y.; Zhang, J.; Polo-Garzon, F.; Wu, Z., Adsorbate-Induced Strong Metal–Support Interactions: Implications for Catalyst Design. *The Journal of Physical Chemistry Letters* **2023**, *14* (2), 524-534.
4. Wang Romero, K.; Polo-Garzon, F.; Wu, Z.; Savara, A.; Jiang, D.-e., Acetylene Semi-Hydrogenation on a Perovskite Oxyhydride Surface: Insights from First Principles and Microkinetic Modeling. *ACS Catalysis* **2023**, *13*, 9213-9221.
5. Yang, W.; Kim, M.-Y.; Polo-Garzon, F.; Gong, J.; Jiang, X.; Huang, Z.; Chi, M.; Yu, X.; Wang, X.; Guo, Y.; Wu, Z., CH₄ combustion over a commercial Pd/CeO₂-ZrO₂ three-way catalyst: Impact of thermal aging and sulfur exposure. *Chemical Engineering Journal* **2023**, *451*, 138930.
6. Yang, W.; Polo-Garzon, F.; Zhou, H.; Huang, Z.; Chi, M.; Meyer Iii, H.; Yu, X.; Li, Y.; Wu, Z., Boosting the Activity of Pd Single Atoms by Tuning Their Local Environment on Ceria for Methane Combustion. *Angewandte Chemie International Edition* **2023**, *62* (5), e202217323.
7. Yu, X.; Cheng, Y.; Li, Y.; Polo-Garzon, F.; Liu, J.; Mamontov, E.; Li, M.; Lennon, D.; Parker, S. F.; Ramirez-Cuesta, A. J.; Wu, Z., Neutron Scattering Studies of Heterogeneous Catalysis. *Chemical Reviews* **2023**, *123* (13), 8638-8700.
8. Yu, X.; Moon, J.; Cheng, Y.; Daemen, L.; Liu, J.; Kim, S. W.; Kumar, A.; Chi, M.; Fung, V.; Ramirez-Cuesta, A. J.; Wu, Z., In Situ Neutron Scattering Study of the Structure Dynamics of the Ru/Ca₂N:e– Catalyst in Ammonia Synthesis. *Chemistry of Materials* **2023**, *35* (6), 2456-2462.
9. Zhang, J.; Wu, Z.; Polo-Garzon, F., Recent Developments in Revealing the Impact of Complex Metal Oxide Reconstruction on Catalysis. *ACS Catalysis* **2023**, *13* (23), 15393-15403.
10. Jiang, X.; Zhang, K.; Forte, M. J.; Cao, S.; Hanna, B. S.; Wu, Z., Recent advances in oxidative dehydrogenation of propane to propylene on boron-based catalysts. *Catalysis Reviews* **2022**, 1-80.