

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
2006 – present	R&D Associate, Staff, Senior Staff, and Distinguished Staff of Chemical Sciences Division (CSD) and Center for Nanophase Materials Sciences (CNMS), ORNL

Research Interests:

- Heterogeneous catalysis, photocatalysis, electrocatalysis;
- Surface chemistry, reaction mechanisms and kinetics via *in situ/operando* spectroscopy including IR, Raman, neutron and X-ray scattering;
- Well-defined nanocatalysts including oxides, supported metals and 2D materials;
- Biomass conversion, natural gas conversion and water splitting.
- **Key Words:** heterogeneous catalysis, photocatalysis, *in situ/operando* spectroscopy, oxide catalysts, metal catalysts, 2D materials.

Synergistic Activities:

- **PI of multiple projects** (~\$4 million per year) from fundamental catalysis to applied catalysis at ORNL including DOE BES Catalysis FWP (2016 – present), EERE-AMO program (2018 - 2021) and ORNL LDRD (2018 - 2020).
- **Thrust/Theme Leader** of UNCAGE-ME Energy Research Frontier Center of DOE-BES (2014 – 2026).
- **Co-PI at CNMS** since 2006
- **Editorial Board:** Chinese Journal of Catalysis, 2014 – present; Chinese Chemical Letters, 2016 – present; Catalysis Today, 2022 – present.
- **International Scientific Committee** of 3rd and 4th *Fundamentals and Applications of Cerium Oxide in Catalysis*, 2018 and 2020.
- **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 – present)

Awards

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

Collaborators and Co-editors:

K. Walton, C. Jones, D. Sholl, R. Lively, Georgia Tech; I. Wachs, J. Baltrusatis, Lehigh University; Y. Lei, University of Alabama – Huntsville; F. Tao, University of Kansas; S.Q. Ma, University of S. Florida; W.Z. Li, University of Iowa.; B. Gunnoe, S. Zhang, University of Virginia; J. Groves, Princeton University, W. Goddard, Caltech; L. Tao, NREL; H.J. Tian, University of West Virginia; S. Laursen, University of Tennessee.

Graduate and Postdoctoral Advisors and Advisees:

PhD Advisors - Qin Xin and Can Li (Dalian Institute of Chemical Physics, Chinese Academy of Sciences, China), A. Guerrero-Ruiz (Institute of Catalysis and Petroleumchemistry, Spain);

Postdoctoral Advisor – Peter Stair (Northwestern University, USA)

Graduate Students - Mar Piernavieja-Hermida (University of Alabama – Huntsville), Lei Bai (University of West Virginia); Xiaohan Ma (Clemson University)

Postdoctoral Associates - Eric Formo (University of Georgia), Amanda Mann (Merck Inc.); Uma Tumuluri (Oak Ridge National Lab), Rui Peng (MilliporeSigma), Guo Shiou Foo (W.L. Gore & Associates), Felipe Polo Garzon (Oak Ridge National Lab), Si Luo (Oak Ridge National Lab), Zhenghong Bao (Oak Ridge National Lab), Jisue Moon (Oak Ridge National Lab), James Kammert (Emerald Cloud Lab), Xiao Jiang (Oak Ridge National Lab), Weiwei Yang (Oak Ridge National Lab)

Full list of publications (total > 220 journal articles plus 6 book chapters, H-index = 60 (Google scholar), total citations > 14000)

1. Bao, Z.; Fung, V.; Moon, J.; Hood, Z. D.; Rochow, M.; Kammert, J.; Polo-Garzon, F.; Wu, Z., Revealing the interplay between “intelligent behavior” and surface reconstruction of non-precious metal doped SrTiO₃ catalysts during methane combustion. *Catalysis Today* **2022**, doi.org/10.1016/j.cattod.2022.03.012.
2. Chen, H.; Xiong, C.; Moon, J.; Ivanov, A. S.; Lin, W.; Wang, T.; Fu, J.; Jiang, D.-e.; Wu, Z.; Yang, Z.; Dai, S., Defect-Regulated Frustrated-Lewis-Pair Behavior of Boron Nitride in Ambient Pressure Hydrogen Activation. *Journal of the American Chemical Society* **2022**, *144* (24), 10688-10693.
3. Coutard, N.; Musgrave, C. B.; Moon, J.; Liebov, N. S.; Nielsen, R. M.; Goldberg, J. M.; Li, M.; Jia, X.; Lee, S.; Dickie, D. A.; Schinski, W. L.; Wu, Z.; Groves, J. T.; Goddard, W. A.; Gunnoe, T. B., Manganese Catalyzed Partial Oxidation of Light Alkanes. *ACS Catalysis* **2022**, *12* (9), 5356-5370.
4. Fadaerayeni, S.; Yu, X.; Sarnello, E.; Bao, Z.; Jiang, X.; Unocic, R. R.; Fang, L.; Wu, Z.; Li, T.; Xiang, Y., Ammonia-Assisted Light Alkane Anti-coke Reforming on Isolated ReOx Sites in Zeolite. *ACS Catalysis* **2022**, *12* (5), 3165-3172.
5. Iftikhar, S.; Martin, W.; Gao, Y.; Yu, X.; Wang, I.; Wu, Z.; Li, F., LaNixFe_{1-x}O₃ as flexible oxygen or carbon carriers for tunable syngas production and CO₂ utilization. *Catalysis Today* **2022**, doi.org/10.1016/j.cattod.2022.07.022.
6. Jiang, X.; Zhang, X.; Purdy, S. C.; He, Y.; Huang, Z.; You, R.; Wei, Z.; Meyer, H. M.; Yang, J.; Pan, Y.; Wu, P.; Zhu, W.; Chi, M.; Page, K.; Huang, W.; Wu, Z., Multiple Promotional Effects of Vanadium Oxide on Boron Nitride for Oxidative Dehydrogenation of Propane. *JACS Au* **2022**, *2* (5), 1096-1104.
7. Li, W.; Nie, X.; Yang, H.; Wang, X.; Polo-Garzon, F.; Wu, Z.; Zhu, J.; Wang, J.; Liu, Y.; Shi, C.; Song, C.; Guo, X., Crystallographic dependence of CO₂ hydrogenation pathways over HCP-Co and FCC-Co catalysts. *Applied Catalysis B: Environmental* **2022**, *315*, 121529.

8. Park, S. J.; Wang, X.; Ball, M. R.; Proano, L.; Wu, Z.; Jones, C. W., CO₂ methanation reaction pathways over unpromoted and NaNO₃-promoted Ru/Al₂O₃ catalysts. *Catalysis Science & Technology* **2022**, *12* (14), 4637-4652.
9. Su, T.; Ma, X.; Tong, J.; Ji, H.; Qin, Z.; Wu, Z., Surface engineering of MXenes for energy and environmental applications. *Journal of Materials Chemistry A* **2022**, *10* (19), 10265-10296.
10. Sun, Y.; Polo-Garzon, F.; Bao, Z.; Moon, J.; Huang, Z.; Chen, H.; Chen, Z.; Yang, Z.; Chi, M.; Wu, Z.; Liu, J.; Dai, S., Manipulating Copper Dispersion on Ceria for Enhanced Catalysis: A Nanocrystal-Based Atom-Trapping Strategy. *Advanced Science* **2022**, *9* (8), 2104749.
11. Sun, Y.; Wu, T.; Bao, Z.; Moon, J.; Huang, Z.; Chen, Z.; Chen, H.; Li, M.; Yang, Z.; Chi, M.; Toops, T. J.; Wu, Z.; Jiang, D.-e.; Liu, J.; Dai, S., Defect Engineering of Ceria Nanocrystals for Enhanced Catalysis via a High-Entropy Oxide Strategy. *ACS Central Science* **2022**, *8* (8), 1081-1090.
12. Wang, K.; Wu, Z.; Jiang, D.-e., Ammonia synthesis on BaTiO_{2.5}H_{0.5}: computational insights into the role of hydrides. *Physical Chemistry Chemical Physics* **2022**, *24* (3), 1496-1502.
13. Wu, Z.; Yang, Q.; Liu, Y.; Zhang, B.; Li, R.; Wang, W.; Wang, J.; Domen, K.; Wang, F.; Fan, F., Can Li: A Career in Catalysis. *ACS Catalysis* **2022**, *12* (5), 3063-3082.
14. Xie, Z.; Yu, S.; Ma, X.; Li, K.; Ding, L.; Wang, W.; Cullen, D. A.; Meyer, H. M.; Yu, H.; Tong, J.; Wu, Z.; Zhang, F.-Y., MoS₂ nanosheet integrated electrodes with engineered 1T-2H phases and defects for efficient hydrogen production in practical PEM electrolysis. *Applied Catalysis B: Environmental* **2022**, *313*, 121458.
15. Xiong, C.; Dai, S.; Wu, Z.; Jiang, D.-e., Single Atoms Anchored in Hexagonal Boron Nitride for Propane Dehydrogenation from First Principles. *ChemCatChem* **2022**, *14* (9), e202200133.
16. Zachman, M. J.; Fung, V.; Polo-Garzon, F.; Cao, S.; Moon, J.; Huang, Z.; Jiang, D.-e.; Wu, Z.; Chi, M., Measuring and directing charge transfer in heterogenous catalysts. *Nature Communications* **2022**, *13* (1), 3253.
17. Barboun, P. M.; Daemen, L. L.; Waitt, C.; Wu, Z. L.; Schneider, W. F.; Hicks, J. C., Inelastic Neutron Scattering Observation of Plasma-Promoted Nitrogen Reduction Intermediates on Ni/gamma-Al₂O₃. *Acs Energy Lett* **2021**, *6* (6), 2048-2053
18. Bhasker-Ranganath, S.; Rahman, M. S.; Zhao, C. L.; Calaza, F.; Wu, Z. L.; Xu, Y., Elucidating the Mechanism of Ambient-Temperature Aldol Condensation of Acetaldehyde on Ceria. *Acs Catal* **2021**, *11* (14), 8621-8634
19. Blum, T.; Graves, J.; Zachman, M. J.; Polo-Garzon, F.; Wu, Z. L.; Kannan, R.; Pan, X. Q.; Chi, M. F., Machine Learning Method Reveals Hidden Strong Metal-Support Interaction in Microscopy Datasets. *Small Methods* **2021**, *5* (5),
20. Chen, H.; Yang, Z. Z.; Wang, X.; Polo-Garzon, F.; Halstenberg, P. W.; Wang, T.; Suo, X.; Yang, S. Z.; Meyer, H. M.; Wu, Z. L.; Dai, S., Photoinduced Strong Metal-Support Interaction for Enhanced Catalysis. *J Am Chem Soc* **2021**, *143* (23), 8521-8526
21. Jiang, X.; Sharma, L.; Fung, V.; Park, S. J.; Jones, C. W.; Sumpter, B. G.; Baltrusaitis, J.; Wu, Z. L., Oxidative Dehydrogenation of Propane to Propylene with Soft Oxidants via Heterogeneous Catalysis. *Acs Catal* **2021**, *11* (4), 2182-2234
22. Luo, S.; Li, M. J.; Fung, V.; Sumpter, B. G.; Liu, J.; Wu, Z. L.; Page, K., New Insights into the Bulk and Surface Defect Structures of Ceria Nanocrystals from Neutron Scattering Study. *Chem Mater* **2021**, *33* (11), 3959-3970
23. Moon, J.; Cheng, Y. Q.; Daemen, L.; Novak, E.; Ramirez-Cuesta, A. J.; Wu, Z. L., On the Structural Transformation of Ni/BaH₂ During a N-2-H-2 Chemical Looping Process for Ammonia Synthesis: A Joint In Situ Inelastic Neutron Scattering and First-Principles Simulation Study. *Top Catal* **2021**, *64* (9-12), 685-692

24. Polo-Garzon, F.; Blum, T. F.; Bao, Z. H.; Wang, K.; Fung, V.; Huang, Z. N.; Bickel, E. E.; Jiang, D. E.; Chi, M. F.; Wu, Z. L., In Situ Strong Metal-Support Interaction (SMSI) Affects Catalytic Alcohol Conversion. *Acs Catal* **2021**, *11* (4), 1938-1945
25. Sharma, L.; Jiang, X.; Wu, Z.; DeLaRiva, A.; Datye, A. K.; Baltrus, J.; Rangarajan, S.; Baltrusaitis, J., Atomically Dispersed Tin-Modified γ -alumina for Selective Propane Dehydrogenation under H₂S Co-feed. *Acs Catal* **2021**, 13472-13482. doi:10.1021/acscatal.1c02859
26. Sharma, L.; Jiang, X.; Wu, Z. L.; Baltrus, J.; Rangarajan, S.; Baltrusaitis, J., Elucidating the origin of selective dehydrogenation of propane on gamma-alumina under H₂S treatment and co-feed. *J Catal* **2021**, *394*, 142-156
27. Wang, S.; Wu, Z. L.; Dai, S.; Jiang, D. E., Deep Learning Accelerated Determination of Hydride Locations in Metal Nanoclusters. *Angew Chem Int Edit* **2021**, *60* (22), 12289-12292
28. Wang, W. Y.; Wang, X. W.; Gan, L.; Ji, X. F.; Wu, Z. L.; Zhang, R. B., All-solid-state Z-scheme BiVO₄-Bi₆O₆(OH)(3)(NO₃)(3) heterostructure with prolonging electron-hole lifetime for enhanced photocatalytic hydrogen and oxygen evolution. *J Mater Sci Technol* **2021**, *77*, 117-125
29. Wang, X.; Li, M. J.; Wu, Z. L., In situ spectroscopic insights into the redox and acid-base properties of ceria catalysts. *Chinese J Catal* **2021**, *42* (12), 2122-2140
30. Wu, Z. L.; Ramirez-Cuesta, A. J.; Fukutani, K., Preface to Special Issue on Neutron Scattering for Catalysis PREFACE. *Top Catal* **2021**, *64* (9-12), 591-592
31. Xie, Z. Q.; Yu, S. L.; Yang, G. Q.; Li, K.; Ding, L.; Wang, W. T.; Cullen, D. A.; Meyer, H. M.; Retterer, S. T.; Wu, Z. L.; Sun, J. Y.; Gao, P. X.; Zhang, F. Y., Ultrathin platinum nanowire based electrodes for high-efficiency hydrogen generation in practical electrolyzer cells. *Chem Eng J* **2021**, *410*,
32. Yang, W.; Gong, J.; Wang, X.; Bao, Z.; Guo, Y.; Wu, Z., A Review on the Impact of SO₂ on the Oxidation of NO, Hydrocarbons, and CO in Diesel Emission Control Catalysis. *Acs Catal* **2021**, *11* (20), 12446-12468. doi:10.1021/acscatal.1c03013
33. J., Atomically Dispersed Tin-Modified γ -alumina for Selective Propane Dehydrogenation under H₂S Co-feed. *ACS Catalysis* **2021**, *11* (21), 13472-13482.
34. Wang, W.; Hood, Z. D.; Zhang, X.; Ivanov, I. N.; Bao, Z.; Su, T.; Jin, M.; Bai, L.; Wang, X.; Zhang, R.; Wu, Z., Construction of 2D BiVO₄-CdS-Ti₃C₂T_x Heterostructures for Enhanced Photo-redox Activities. *ChemCatChem* **2020**, *12* (13), 3496-3503.
35. Zhang, J. Y.; Wegener, E. C.; Samad, N. R.; Harris, J. W.; Unocic, K. A.; Allard, L. F.; Purdy, S.; Adhikari, S.; Cordon, M. J.; Miller, J. T.; Krause, T. R.; Cheng, S. C.; Liu, D. X.; Li, M. J.; Jiang, X.; Wu, Z. L.; Li, Z. L., Isolated Metal Sites in Cu-Zn-Y/Beta for Direct and Selective Butene-Rich C₃⁺ Olefin Formation from Ethanol. *Acs Catal* **2021**, *11* (15), 9885-9897
36. Zhu, X.; Gao, Y. F.; Wang, X. J.; Haribal, V.; Liu, J. C.; Neal, L. M.; Bao, Z. H.; Wu, Z. L.; Wang, H.; Li, F. X., A tailored multi-functional catalyst for ultra-efficient styrene production under a cyclic redox scheme. *Nat Commun* **2021**, *12* (1), 1329.
37. Zhu, M.; Tian, P.; Cao, X.; Chen, J.; Pu, T.; Shi, B.; Xu, J.; Moon, J.; Wu, Z.; Han, Y.-F., Vacancy engineering of the nickel-based catalysts for enhanced CO₂ methanation. *Applied Catalysis B: Environmental* **2021**, *282*, 119561.
38. Zhang, X. Y.; You, R.; Wei, Z. Y.; Jiang, X.; Yang, J. Z.; Pan, Y.; Wu, P. W.; Jia, Q. D.; Bao, Z. H.; Bai, L.; Jin, M. Z.; Sumpter, B.; Fung, V.; Huang, W. X.; Wu, Z. L., Radical Chemistry and Reaction Mechanisms of Propane Oxidative Dehydrogenation over Hexagonal Boron Nitride Catalysts. *Angew Chem Int Edit* **2020**, *59* (21), 8042-8046.
39. Zhang, J. Y.; Zhang, J. B.; Li, M. J.; Wu, Z. L.; Dai, S.; Huang, K., Solvent-free and one-pot synthesis of ultramicroporous carbons with ultrahigh nitrogen contents for sulfur dioxide capture. *Chem Eng J* **2020**, *391*.

40. Yang, J.; Xiao, W.; Chi, X.; Lu, X. X.; Hu, S. Y.; Wu, Z. L.; Tang, W. X.; Ren, Z.; Wang, S. B.; Yu, X. J.; Zhang, L. Z.; Rusydi, A.; Ding, J.; Guo, Y. B.; Gao, P. X., Solar-driven efficient methane catalytic oxidation over epitaxial ZnO/La_{0.8}Sr_{0.2}CoO₃ heterojunctions. *Appl Catal B-Environ* **2020**, *265*.
41. Wu, S.; Sun, J.; Li, Q.; Hood, Z. D.; Yang, S.; Su, T.; Peng, R.; Wu, Z.; Sun, W.; Kent, P. R. C.; Jiang, B.; Chisholm, M. F., Effects of Surface Terminations of 2D Bi₂WO₆ on Photocatalytic Hydrogen Evolution from Water Splitting. *Acs Appl Mater Inter* **2020**, *12* (17), 20067-20074.
42. Wu, P. W.; Tan, S.; Moon, J.; Yan, Z. H.; Fung, V.; Li, N.; Yang, S. Z.; Cheng, Y. Q.; Abney, C. W.; Wu, Z. L.; Savara, A.; Momen, A. M.; Jiang, D. E.; Su, D.; Li, H. M.; Zhu, W. S.; Dai, S.; Zhu, H. Y., Harnessing strong metal-support interactions via a reverse route. *Nat Commun* **2020**, *11* (1).
43. Wang, W. Y.; Hood, Z. D.; Zhang, X. Y.; Ivanov, I. N.; Bao, Z. H.; Su, T. M.; Jin, M. Z.; Bai, L.; Wang, X. W.; Zhang, R. B.; Wu, Z. L., Construction of 2D BiVO₄-CdS-Ti₃C₂Tx Heterostructures for Enhanced Photo-redox Activities. *Chemcatchem* **2020**, *12* (13), 3496-3503.
44. Wang, K.; Fung, V.; Wu, Z. L.; Jiang, D. E., Stable Surface Terminations of a Perovskite Oxyhydride from First-Principles. *J Phys Chem C* **2020**, *124* (34), 18557-18563.
45. Wang, F.; Wu, Z. L., Preface to Special Issue on Advances in Ceria Catalysis. *Chinese J Catal* **2020**, *41* (6), 899-900.
46. Wan, Q.; Fung, V.; Lin, S.; Wu, Z. L.; Jiang, D. E., Perovskite-supported Pt single atoms for methane activation. *J Mater Chem A* **2020**, *8* (8), 4362-4368.
47. Tian, C. C.; Zhang, H. Y.; Zhu, X.; Lin, B.; Liu, X. F.; Chen, H.; Zhang, Y. F.; Mullins, D. R.; Abney, C. W.; Shakouri, M.; Chernikov, R.; Hu, Y. F.; Polo-Garzon, F.; Wu, Z. L.; Fung, V.; Jiang, D. E.; Liu, X. M.; Chi, M. F.; Jimmy, J. L.; Dai, S., A new trick for an old support: Stabilizing gold single atoms on LaFeO₃ perovskite. *Appl Catal B-Environ* **2020**, *261*.
48. Shu, Y.; Chen, H.; Chen, N. Q.; Duan, X. L.; Zhang, P. F.; Yang, S. Z.; Bao, Z. H.; Wu, Z. L.; Dai, S., A Principle for Highly Active Metal Oxide Catalysts via NaCl-Based Solid Solution. *Chem* **2020**, *6* (7), 1723-1741.
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55. Huang, R. H.; Fung, V.; Wu, Z. L.; Jiang, D. E., Understanding the conversion of ethanol to propene on In₂O₃ from first principles. *Catal Today* **2020**, *350*, 19-24.
56. Fung, V.; Hu, G.; Wu, Z.; Jiang, D. E., Hydrogen in Nanocatalysis. *The Journal of Physical Chemistry Letters* **2020**, *11* (17), 7049-7057.

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63. Wang, S. T.; Yu, Y. C.; Luo, S.; Cheng, X. P.; Feng, G. Y.; Zhang, Y. F.; Wu, Z. L.; Compagnini, G.; Pooran, J.; Hu, A. M., All-solid-state supercapacitors from natural lignin-based composite film by laser direct writing. *Appl Phys Lett* **2019**, *115* (8).
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Selected presentations (total > 130)

1. Zili Wu, **Invited Department Seminar** “Revealing the role of hydrides in hydrogenation reactions with in situ Neutron Scattering”. Department of Chemistry, North Carolina Agricultural and Technical State University. May 5th, 2022 (virtual).
2. Zili Wu. **Invited talk** titled “In situ Neutron scattering studies of electride- and hydride-based catalysts for ammonia synthesis”. ACS Fall 2022, August 21 - 26, 2022.
3. Zili Wu. Poster presentation titled “New mechanistic insights into hydrogenation reactions from in situ neutron scattering studies”. New York, NY, May 22-27, 2022.
4. Zili Wu, **invited talk**, “Revealing the role of hydrides in hydrogenation reactions with *in situ* neutron scattering”, PacifiChem, Dec. 16-21, 2021(virtual).
5. Zili Wu. **Invited talk** “Facet-controlled nanoparticles towards understanding catalysis over perovskites”. 2021 Spring ACS National Meeting, April 5-30, 2021(virtual).
6. Zili Wu. **plenary talk** “Unique Insights into heterogeneous Catalysis via neutron scattering”, UK-US Catalysis Collaboration Workshop, March 10-11, 2021 (virtual).
7. Zili Wu. **Invited talk** titled “On the reaction mechanism of oxidative dehydrogenation of propane over boron-based catalysts”. ACS Fall 2021, August 22 - 26, 2021. (Virtual).
8. Zili Wu. **Invited Seminar** “Fundamental Catalysis in Hydrogen Production and Utilization” at Department of Material Science & Engineering, Clemson University, Nov 12, 2020 (virtual).
9. Zili Wu. **Invited talk** “Faceted nanoparticles towards understanding catalysis over ternary oxides”. 2020 Spring ACS National Meeting, Philadelphia, PA. March 22-26. The meeting was canceled due to COVID-19 situation.
10. Zili Wu. **Invited talk** “Catalysis facilitated by interfaces and heterojunctions”. 2020 Spring ACS National Meeting, Philadelphia, PA. March 22-26. The meeting was canceled due to COVID-19 situation.
11. Zili Wu. **Invited talk** “On the mechanism and kinetics of ammonia synthesis over electride-based catalysts: *In situ* neutron scattering and kinetic studies”. 2020 Spring ACS National Meeting, Philadelphia, PA. March 22-26. The meeting was canceled due to COVID-19 situation.
12. Zili Wu. **Invited seminar** “Fundamental Catalysis in Hydrogen Production and Utilization” at Large Scale Structures Group at SNS, ORNL, May 28, 2020. (virtual)
13. Zili Wu. **Invited talk** titled “Revealing the nature of active hydrogen species for ammonia synthesis over electride-based catalysts: *in situ* neutron scattering and kinetic studies”. 2020 Fall ACS National Meeting, San Francisco, CA, August 16-20, 2020. (Virtual).
14. Zili Wu. **Invited talk** titled “Catalysis over faceted ternary oxides: interplay between surface plane and reconstruction”. 2020 Fall ACS National Meeting, San Francisco, CA, August 16-20, 2020. (Virtual).

15. Zili Wu, **Invited talk** titled “Unique Insights into Fundamental Catalysis in Hydrogen Production and Utilization via neutron scattering”. 2020 ORNL Neutron Advisory Board Meeting, Sept 2, 2020. (virtual)
16. Zili Wu, **invited department seminar** titled “Catalysis over Metal Oxides: Shape and Composition Effects” at Department of Chemical Engineering, Kansas State University, Nov 7, 2018.
17. Zili Wu, **invited department seminar** titled “Catalysis over Metal Oxides: Shape and Composition Effects” at Department of Chemical and Petroleum Engineering, Kansas University, Nov 8, 2018.
18. Zili Wu, **invited talk** titled “Shape effect in oxide catalysis: from binary to ternary oxides” at 2019 Spring ACS National Meeting, Orlando FL, March 31-April 4, 2019.
19. Zili Wu, **invited talk** titled “Kinetics and Mechanism of Alcohol Conversions over Shape-controlled Oxide Nanocrystals” at 2019 Spring ACS National Meeting, Orlando FL, March 31-April 4, 2019.
20. Zili Wu, **keynote talk** titled “Catalysis over Metal Oxides: Shape and Composition Effects” at 2019 Chicago Catalysis Club Annual Symposium, Naperville, IL, April 16, 2019.
21. Zili Wu, **dinner talk** titled “Effects of Shape and Composition over Metal Oxide Catalysis”, at the May monthly meeting of Catalysis Society of Metropolitan New York, May 15, 2019, Somerset, NJ.
22. Zili Wu, talk titled “Development of oxy-esterification for natural gas upgrading at the wellhead” at EERE-AMO PI meeting, Arlington, VA, June 11-12, 2019.
23. Zili Wu, talk titled “Novel insights into catalysis from in situ neutron scattering studies” at 26th North American Catalysis Society Meeting, Chicago, IL, June 23-28, 2019.
24. Zili Wu, poster titled “Molecular transformation and catalytic reactions on structurally well-defined catalysts” at BES Catalysis PI meeting, Gaithersburg, MD, July 24-26, 2019.
25. Zili Wu, talk titled “Role of surface structure and dopants on the interaction and conversion of acid gases over metal oxide and sulfide catalysts” at EFRC PI meeting, Washington DC, July 29-30, 2019.
26. Zili Wu, **invited talk** titled “Surface reconstruction of ternary oxides: does surface facet still matter?” at 2019 Fall ACS National Meeting, San Diego, CA, August 25-29, 2019.
27. Zili Wu, **invited talk** titled “New Catalytic Insights from in situ neutron scattering investigations” at 2019 Fall ACS National Meeting, San Diego, CA, August 25-29, 2019.
28. Zili Wu, “Catalysis over metal oxides: shape and composition effects”, 2018 Mesilla Chemistry Workshop, Mesilla, NM, Feb 3-7, 2018. **Invited talk.**
29. Zili Wu, “Consequences of surface reconstruction of perovskites in catalyzing acid-base reactions”, 2018 Spring ACS Meeting, New Orleans, LA, March 18-22, 2018. **Invited talk.**
30. Zili Wu, “Kinetics and Mechanism of Alcohol Conversion over Shape-controlled Oxide Nanocrystals”, 2018 Spring ACS Meeting, New Orleans, LA, March 18-22, 2018. **Invited talk.**
31. Zili Wu, “New Insights Into Catalysis from Neutron Scattering”, 25th Canadian Symposium on Catalysis, Saskatoon, Canada, May 8-11, 2018. **Invited talk.**
32. Zili Wu, “Shape matters: Oxide nanocrystals as catalysts and catalyst supports”, 2018 Fall ACS Meeting, Boston, MA, August 19-23, 2018. **Invited talk.**
33. Zili Wu, “Photocatalysis facilitated by heterojunctions in two dimensional materials”, 2018 Fall ACS Meeting, Boston, MA, August 19-23, 2018. **Invited talk.**
34. Zili Wu, “Molecular Transformation and Catalytic Reactions on Structurally well-defined Catalysts”, 2017 BES Catalysis PI Meeting, Washington DC, July 30- August 1, 2018. Poster presentation.
35. Zili Wu, “Catalysis over metal oxides: Shape and composition effect”, Department of Chemical & Biomolecular Engineering, UTK, Sept 25, 2018. **Invited department seminar.**
36. Zili Wu, “Exploring two-dimensional materials as novel photocatalysts for hydrogen production from water splitting”, 2017 Spring ACS Meeting, San Francisco, April 2-7, 2017. **Invited talk.**

37. Zili Wu, "Understanding the role of interfaces in gold nanocluster catalysis through gas phase CO oxidation", 2017 Spring ACS Meeting, San Francisco, April 2-7, 2017. **Invited talk.**
38. Zili Wu, "Role of Interfaces in Catalysis: From Gas Phase to Aqueous Phase Reactions". Department of Chemistry, UC-Riverside. April 17, 2017. **Invited department seminar.**
39. Zili Wu, "Catalytic Role of Ligands in Supported Au_nR_m Nanoclusters for Gas Phase Reactions", 2017 Spring MRS Meeting, Phoenix, AZ, April 17-21, 2017. Oral presentation.
40. Zili Wu, Tuning Two-Dimensional Materials for Photocatalytic Hydrogen Production from Water Splitting, 25th North American Catalysis Society meeting, Denver, Co. June 4-9, 2017. Oral presentation.
41. Zili Wu, "Role of interfaces and heterojunctions in gas and aqueous phase catalysis", 2017 Fall ACS Meeting, Washington DC, August 20-24, 2017. **Invited talk.**
42. Zili Wu, "Role of surface and bulk structures of perovskites in catalyzing acid-base reactions" 2017 Fall ACS Meeting, Washington DC, August 20-24, 2017. **Invited talk.**
43. Zili Wu, "Role of Surface Structure and Dopants on the Interaction Between Acid Gases and Metal Oxide Catalysts", 2017 EFRC PI Meeting, Washington DC, July 24-25, 2017. Oral presentation.
44. Zili Wu, "Molecular Transformation and Catalytic Reactions on Structurally well-defined Catalysts", 2017 BES Catalysis PI Meeting, Washington DC, July 26-28, 2017. Poster presentation.
45. Wu, Z. L., "Role of Interfaces in Catalysis: From Gas Phase to Aqueous Phase Reactions", **invited Chemistry Department Seminar** at University of South Florida, Tampa, FL, Oct 20, 2016.
46. Wu, Z. L. *, *In situ* Vibrational Spectroscopy Investigation of the Surface Dependent Redox and Acid-base Properties of Ceria Nanocrystals. AVS 62nd International Symposium & Exhibition, Oct 18 – 23, 2015, San Jose, CA. (**invited talk**)
47. Wu, Z. L. *, Surface structure dependence of SO₂ interaction with CeO₂ nanoshapes with well-defined facets. PacifiChem 2015 Meeting, Dec 15 – 20, 2015, Honolulu, HI. (oral)
48. Wu, Z. L. *, On the catalytic role of ligands in supported Au_nR_m nanoclusters. PacifiChem 2015 Meeting, Dec 15 – 20, 2015, Honolulu, HI. (poster)
49. Wu, Z. L. *, Catalytic role of ligands in supported Au_nR_m nanoclusters for gas phase reactions. 251st American Chemical Society National Meeting, March 13-17, 2016, San Diego, CA. (**invited talk**).
50. Yuyuan Lin*, Zili Wu, Jianguo Wen, Kunlun Ding, Kenneth Poeppelmeier, Laurence Marks, Morphology and atomic structures of gold on ceria nanostructures: The role of surface structure and oxidation state of ceria supports. 251st *American Chemical Society* National Meeting, March 13-17, 2016, San Diego, CA. (**invited talk**).
51. Wu, Z. L. *, Reaction mechanisms of oxygenates over oxide catalysts: role of surface structure and composition. DOE BES Catalysis PI Meeting, June 22-24, 2016, Gaithersburg, Maryland. (**invited talk**)
52. Wu, Z. L. *, Molecular transformations and catalytic reactions on structurally well-defined surfaces. DOE EERE Merit Review, June 6-10, 2016, Washington DC. (**invited poster**)
53. Wu, Z. L. *, Shape Matters: Redox and Acid-Base Catalysis by Ceria Nanocrystals. 16th International Congress on Catalysis (ICC) Satellite Symposium: "Fundamentals and Applications of Cerium Dioxide in Catalysis", June 30 – July 2, 2016, Beijing, China. (**invited talk**)
54. Peng, R., Wang, H., Wu, Z. L. *, Novel 2-D materials for photocatalytic hydrogen production from water splitting: transition metal carbides (MXenes) and transition metal dichalcogenides (TMDs) 16th International Congress on Catalysis (ICC), July 3 – 8, 2016, Beijing, China. (oral)
55. Wu, Z. L. *, Role of Interfaces in Catalysis: From Gas Phase to Aqueous Phase Reactions. post-symposium of 16th ICC: "Nano and Interfacial Catalysis", July 9 – 11, 2016, Dalian, China. (**invited talk**).

56. Uma Tumuluri, Joshua Howe, William Mounfield, Meijun Li, Krista Walton, David Sholl, Sheng Dai, Zili Wu*, Effect of surface structure on CO₂ adsorption on TiO₂ nanoparticles: Experimental and theoretical investigations. 252nd *American Chemical Society* National Meeting, August 21-25, 2016, Philadelphia, PA. (Oral).
57. Wu, Z. L.*, Oxygenates conversion over oxide surfaces: interplay between acid-base and redox site. 252nd *American Chemical Society* National Meeting, August 21-25, 2016, Philadelphia, PA. **(Invited talk)**.
58. Peng, R.* and Wu, Z. L., MXene-TiO₂ composites as effective photocatalysts for hydrogen production under visible light irradiation. 252nd *American Chemical Society* National Meeting, August 21-25, 2016, Philadelphia, PA. (Oral).
59. Mar Piernavieja-Hermida, Zheng Lu, Zili Wu, Yu Lei*, Towards the thermally stable site-isolated Pd catalysts. 252nd *American Chemical Society* National Meeting, August 21-25, 2016, Philadelphia, PA. **(Invited talk)**.
60. Ryan Lively*, Guanghui Zhu, Simon Pang, Yang Liu, Uma Tumuluri, Zili Wu, David Sholl, Sankar Nair, Christopher Jones, Engineering nanoporous materials with increased acid gas resistance. 252nd *American Chemical Society* National Meeting, August 21-25, 2016, Philadelphia, PA. **(Invited talk)**.
61. Zheng Lu, Mar Piernavieja-Hermida, Zili Wu, Yu Lei*, Gold-based catalysts for propylene epoxidation. 252nd *American Chemical Society* National Meeting, August 21-25, 2016, Philadelphia, PA. **(Invited talk)**.
62. Yuanyuan He, Michael Ford*, Minghui Zhu, Uma Tumuluri, Zili Wu, Israel Wachs, Influence of catalyst synthesis method on selective catalytic reduction (SCR) of NO by NH₃ with V₂O₅-WO₃/TiO₂ catalysts. 252nd *American Chemical Society* National Meeting, August 21-25, 2016, Philadelphia, PA. (Oral).
63. Wu, Z. L.*, Role of Interfaces in Catalysis: From Gas Phase to Aqueous Phase Reactions. ORNL PSD Materials and Chemistry Seminar Series, Sept 14, 2014. **(invited talk)**
64. Amanda Mann, Zili Wu, David Mullins, Steven Overbury*, Structure sensitivity and reaction pathways in oxygenate reactions catalyzed by CeO₂. **Invited talk at 449th National ACS Meeting**, March 22-26, 2015, Denver, Co.
65. Zili Wu*, Amanda Mann, Steven Overbury, On the surface dependent acid-base property of ceria nanoshapes. *Oral presentation at 449th National ACS Meeting*, March 22-26, 2015, Denver, CO.
66. Zili Wu*, Deen Jiang, Amanda Mann, Rongchao Jin, Laisheng Wang, Steven H. Overbury, Understanding the Catalytic Role of Ligands in Supported Au_nm Nanoclusters for Gas Phase Reactions. *Oral presentation at 24th North American Catalysis Society Meeting*, June 14-19, 2015, Pittsburgh, PA.
67. Li Zhang*, Zili Wu, Steven H. Overbury, The Role of CO₂ in Ethylbenzene Dehydrogenation Reaction over a Mesoporous Ceria Catalyst. *Oral presentation at 24th North American Catalysis Society Meeting*, June 14-19, 2015, Pittsburgh, PA.
68. Zheng Ren*, Zili Wu, Puxian Gao, Operando Study of Low Temperature C₃H₈ Oxidation over Ni_xCo_{3-x}O₄ Nano-Array Catalysts: Ni Dopant Effect, Reaction Mechanism and Structural Stability. *Oral presentation at 24th North American Catalysis Society Meeting*, June 14-19, 2015, Pittsburgh, PA.
69. Zili Wu*, Ligands Effect in Gold Catalysis: the Good, the Bad and the Ugly. **Invited talk at 15th National Youth Conference on Catalysis**, July 19-23, 2015, Hefei, Anhui Province, China.
70. Zili Wu*, Structure sensitivity in redox and acid-base reactions catalyzed by CeO₂ nanoshapes. **Invited talk at 1st International Conference on Applied Surface Science**, July 27-30, 2015, Shanghai, China.
71. Zili Wu*, Viviane Schwartz, Shannon Kraemer, Yutong Tsai, Meijun Li, Adam Rondinone, Steven Overbury, Support morphology effect in oxide catalysis: Vanadia clusters supported on ceria and titania nanoshapes. **Invited talk at 450th National ACS Meeting**, August 16-20, 2015, Boston, MA.

72. Minghui Zhu, Michael E. Ford, Yuanyuan He, Israel E. Wachs, Uma Tumuluri, Zili Wu*, Comparison of Co-precipitated and Impregnated Supported WO_3/TiO_2 and $\text{V}_2\text{O}_5\text{-WO}_3/\text{TiO}_2$ Catalysts for Selective Reduction (SCR) of NO with NH_3 . **Invited talk at 450th National ACS Meeting**, August 16-20, 2015, Boston, MA.
73. Rui Peng*, Zili Wu, Limited layered MoS_2 nanosheets as novel photocatalyst for solar hydrogen production from the splitting of water. *Oral presentation at 450th National ACS Meeting*, August 16-20, 2015, Boston, MA.
74. Uma Tumuluri*, Meijun Li, Sheng Dai, Gernot Rother, Zili Wu, In situ spectroscopic study of the effect of surface structure on the interaction of SO_2 with CeO_2 . *Oral presentation at 450th National ACS Meeting*, August 16-20, 2015, Boston, MA.
75. Meijun Li, Uma Tumuluri*, Zili Wu, Sheng Dai, Dopants effect on the adsorption of CO_2 on CeO_2 surfaces. *Oral presentation at 450th National ACS Meeting*, August 16-20, 2015, Boston, MA.
76. Aditya Savara*, Michael Kandziolka, Michelle Kidder, Lance Gill, Zili Wu, Aromatic-hydroxyl interaction of a lignin model-compound on SBA-15, present at pyrolysis temperatures. *Oral presentation at 450th National ACS Meeting*, August 16-20, 2015, Boston, MA.
77. L. F. Allard*, W. C. Bigelow, Z. Wu, S. H. Overbury, K. Unocic, W. B. Carpenter, F. S. Walden, R. L. Thomas, D. S. Gardiner, B. W. Jacobs, D. P. Nackashi and J. Damiano, Computer-Controlled *In Situ* Gas Reactions via a MEMS-based Closed-Cell System. *Oral presentation at Microscopy & Microanalysis 2015 meeting*, Portland, OR, August 2-6, 2015.
78. Wu, Z. L., Shape effect in catalysis: ceria nanoshapes as catalysts and catalyst supports. Chemical and Biomelecular Engineering **Graduate Seminar** at University of Tennessee at Knoxville, Oct. 15, 2013.
79. Wu, Z. L.; Mann, A. K. P.; Li, M. J.; Overbury, S. H., Surface dependent acid-base property of ceria nanoshapes. **Invited talk at 247th ACS Meeting**, Dallas, TX, March 16-20, 2014.
80. Wu, Z. L., Understanding shape effect in catalysis: ceria nanocrystals as catalyst and catalyst support. ORNL Materials and Chemistry Seminar Series, April 23, 2014.
81. Wu, Z. L., Understanding shape effect in catalysis: ceria nanocrystals as catalyst and catalyst support. Poster presentation at ORNL PSD Advisory Committee Meeting, May 22, 2014.
82. Wu, Z. L.; Mann, A. K. P.; Li, M. J.; Overbury, S. H., Understanding shape effect in catalysis: ceria nanocrystals as catalyst and catalyst support. Poster presentation at GRC on Catalysis, New London, NH, June 22-27, 2014.
83. Wu, Z. L.; Mann, A. K. P.; Li, M. J.; Overbury, S. H., Understanding shape effect in catalysis: ceria nanocrystals as catalyst and catalyst support. Poster presentation at poster session with Nobel Laureate Dr. Venki Ramakrishnan, ORNL, July 28, 2014.
84. Wu, Z. L., Understanding shape effect in catalysis: ceria nanocrystals as catalyst and catalyst support. **Invited talk at 248th ACS Meeting**, San Francisco, CA, August 10-14, 2014.
85. Soykal, I.; Wang, H.; Wu, Z. L.; Liang, C. D.; Schwartz, V., Investigation of silica supported fullerence catalysts for oxidative dehydrogenation of alkanes. Oral presentation at 248th ACS Meeting, San Francisco, CA, August 10-14, 2014.
86. Wu, Z. L., Thiolate Ligands Effect on CO oxidation over CeO_2 -supported $\text{Au}_{25}(\text{SR})_{18}$ Nanoclusters. Oral presentation at the 8th International Conference on Environmental Catalysis, Asheville, NC, August 24-27, 2014.
87. Wu, Z. L., Understanding shape effect in catalysis: ceria nanocrystals as catalyst and catalyst support. Poster presentation at Southeastern Catalysis Society 13th Annual Fall Symposium, Sept 14-15, 2014.
88. Zhang, L.; Wu, Z. L.; Nelson, N.; Sadow, A.; Slowing, I.; Overbury, S. H., DRIFTS and Raman study of the role of CO_2 as a soft oxidant for dehydrogenation of ethylbenzene to styrene over ceria catalysts. Poster presentation at Southeastern Catalysis Society 13th Annual Fall Symposium, Sept 14-15, 2014.

89. Wu, Z. L.; Li, M. J.; Overbury, S. H., Are the surfaces of oxide nanocrystals with defined facets as perfect as they appear? – A case study of nanoshaped ceria catalysts. Poster presentation at Southeastern Catalysis Society 11th Annual Fall Symposium, Sept 30 – Oct 1, 2012.
90. Wu, Z. L.; Schwartz, V.; Kraemer, S.; Tsai, Y. T.; Li, M. J.; Rondinone, A.; Overbury, S. H., Support Morphology Effect in Nanocatalysis: Vanadia Clusters Supported Ceria and Titania Nanoshapes. **Invited talk** at the Joint NSRC Workshop on Nanoparticle Science, Nov. 5-6, 2012, Argonne National Laboratory, Argonne, IL.
91. Gaur, S.; He, M.; Wu, Z. L.; Bruce, D.; Kumar, C.; Spivey, J., A combined experimental and theoretical study on CO oxidation mechanism over Au₃₈-derived Au/TiO₂ catalyst. Oral presentation at 2012 AIChE Annual Meeting, Pittsburgh, PA, Oct 28 – Nov 2, 2012.
92. Overbury, S. H.; Wu, Z. L.; Li, M. J.; Calaza, F. C., Structure dependences in reactions of C₂ oxygenates on CeO₂ nanoshapes. Oral presentation at 245th ACS Meeting, New Orleans, LA, April 7-11, 2013.
93. Wu, Z. L.; Li, M. J.; Schwartz, V.; Overbury, S. H., Shape Effect in Metal oxide catalysis: ceria nanoshapes as catalysts and supports. Oral presentation at 245th ACS Meeting, New Orleans, LA, April 7-11, 2013.
94. Narula, C. K.; Allard, L. F.; Moses-DeBusk, M.; Mullins, D. R.; Stocks, G. M.; Yang, X.; Yoon, M.; Wu, Z. L., Catalysis on single Pt atoms supported on theta-alumina. Oral presentation at 245th ACS Meeting, New Orleans, LA, April 7-11, 2013.
95. Wu, Z. L.; Li, M. J.; Mullins, D. R.; Overbury, S. H., Are the surfaces of oxide nanocrystals with defined facets as perfect as they appear? – A case study of nanoshaped ceria catalysts. Oral presentation at the 23rd North American Catalysis Society Meeting, Louisville, KY, June 2-7, 2013.
96. Li, M. J.; Calaza, F. C.; Wu, Z. L.; Mullins, D. R.; Overbury, S. H., Effect of Structure and Reduction Upon the Surface Chemistry of Acetaldehyde On CeO₂ Nanoshapes. Oral presentation at the 23rd North American Catalysis Society Meeting, Louisville, KY, June 2-7, 2013.
97. Moses-DeBusk, M.; Yoon, M.; Allard, L. F.; Mullins, D. R.; Stocks, G. M.; Yang, X.; Wu, Z. L.; Veith, G. M.; Narula, C. K. Experimental and First Principles Study of CO Oxidation on Supported Single Pt Atoms. Poster presentation at the 23rd North American Catalysis Society Meeting, Louisville, KY, June 2-7, 2013.
98. Wu, Z. L.; Overbury, S. H., Revealing the surface structure of ceria nanocrystals with well-defined facets. Invited talk at DOE Catalysis Contractor Meeting, Annapolis, MD, June 30 – July 2nd, 2013.
99. Wu, Z. L., Optical spectroscopy at CNMS for nanomaterials Research. Invited talk at the 2013 Neutrons and Nano User Meetings, Oak Ridge, TN, August 12-15, 2013.
100. Wu, Z. L.; Li, M. J.; Mann, A. K.; Mullins, D. R.; Overbury, S. H., Surface dependent reactions of C₁ and C₂-alcohols on ceria nanocrystals with defined surface facets. Invited talk at 246th ACS Meeting, Indianapolis, IN, Sept 8-12, 2013.
101. Dathar, G. K. P.; Xu, Y.; Tsai, Y. T.; Schwartz, V.; Wu, Z. L.; Liang, C. D.; Rondinone, A. J.; Overbury, S. H., Metal-free oxidative dehydrogenation of isobutane by functionalized carbon. Oral presentation at 246th ACS Meeting, Indianapolis, IN, Sept 8-12, 2013.
102. Mann, A. K.; Calaza, F. C.; Albrecht, P.; Li, M. J.; Wu, Z. L.; Mullins, D. R.; Overbury, S. H., Structure dependence in acetaldehyde reactions on CeO₂ studied using monolithic and nanoscopic single crystal surfaces. Oral presentation at 246th ACS Meeting, Indianapolis, IN, Sept 8-12, 2013.
103. Mann, A. K.; Wu, Z. L.; Calaza, F. C.; Overbury, S. H., Elucidation of the structure-dependent catalytic properties of shape-controlled cerium oxide (CeO₂) nanocrystals. Oral presentation at 246th ACS Meeting, Indianapolis, IN, Sept 8-12, 2013.
104. Wu, Z. L., Structure dependence of CO oxidation over ceria nanoshapes, poster presentation at 2011 DOE/BES Catalysis Sciences Meeting, Oct 02 – 05, 2011, Annapolis, MD.

105. Wu, Z. L.; Li, M. J.; Overbury, S. H., In Situ Spectroscopic Investigation of the Surface Dependence of CO Oxidation Over CeO₂ Nanocrystals with Well-Defined Surface Planes, oral presentation at the 2011 AIChE Annual Meeting, Oct 16-21, 2011, Minneapolis, MN.
106. Zhang, Z. Y.; Li, W. Z.; Li, M. J.; Wu, Z. L., Ultra-Thin Ptfe-Nanowires As Durable Electrocatalysts for Oxygen, oral presentation at the 2011 AIChE Annual Meeting, Oct 16-21, 2011, Minneapolis, MN.
107. Zhang, Z. Y.; Li, W. Z.; More, K. L.; Sun, K.; Wu, Z. L., High Active PdFe-Nanoleave Catalyst for Oxygen Reduction Reaction In Alkaline Media, oral presentation at the 2011 AIChE Annual Meeting, Oct 16-21, 2011, Minneapolis, MN
108. Li, M. J.; Wu, Z. L.; Calaza, F. C.; Mullins, D. R.; Overbury, S. H., Surface Structure Dependence by Monofaceted CeO₂ Nanoparticles: Catalytic Oxidation Reactions, oral presentation at AVS 58th International Symposium and Exhibition, Oct 30 – Nov. 4, 2011, Nashville, TN.
109. Formo, E.; Wu, Z. L.; Mahurin, S.; Dai, S., Utilizing Surface Enhanced Raman Spectroscopy for the Study of Interfacial Phenomena: Probing Interactions on an Alumina Surface, Oral presentation at 2011 MRS Fall Meeting, Nov 28 – Dec 2, 2011, Boston, MA
110. Formo, E., Wu, Z. L.; Mahurin, S. M.; Dai, S., Unlocking surface enhanced Raman spectroscopy for the analysis of catalytic systems and interfaces. Oral presentation at 243rd ACS National Meeting, San Diego, California, March 25-29, 2012.
111. Li, M. J.; Wu, Z. L.; Calaza, F. C.; Mullins, D. R.; Xu, Y.; Overbury, S. H., Surface Structure Dependence by Monofaceted CeO₂ Nanoparticles: Catalytic Oxidation Reactions, Oral presentation at 243rd ACS National Meeting, San Diego, California, March 25-29, 2012.
112. Wu, Z. L.; Rondinone, A. J.; Overbury, S. H., Revealing the Structure of Vanadium Oxide Supported on Ceria by *In situ* Multi-wavelength Raman Spectroscopy. Poster presentation at 5th International Congress on Operando Spectroscopy, Upton, NY, April 29 – May 03, 2012.
113. Wu, Z. L.; Schwartz, V.; Li, M. J.; Rondinone, A. J.; Overbury, S. H., Support Shape Effect in Metal Oxide Catalysis: Vanadia Supported on Ceria Nanocrystals with Defined Surface Planes. Poster presentation at Gordon Research Conference on Catalysis, New London, NH, June 24 – 29, 2012.
114. Wu, Z. L.; Anjos, D. M.; Brown, G. M.; Overbury, S. H., In situ UV resonance Raman spectroelectrochemical study of the redox chemistry of 9, 10-phenanthroquinone on carbon surfaces. Oral presentation at 244th ACS National Meeting, Philadelphia, PA, August 19-23, 2012.
115. Gaur, S.; Wu, Z. L.; Stanley, G. G.; Kumar, C.; Spivey, J., On the deactivation of Au₃₈ cluster-derived Au/TiO₂ catalyst during CO oxidation. Oral presentation at 244th ACS National Meeting, Philadelphia, PA, August 19-23, 2012.
116. Savara, A.; Calaza, F.; Mullins, D. R.; Xu, Y.; Wu, Z. L.; Overbury, S. H., C-C coupling of carbonyls over metal oxides: The roles of acid and base sites in aldol addition reactions. Oral presentation at 244th ACS National Meeting, Philadelphia, PA, August 19-23, 2012.
117. Narula, C. K.; Allard, L. F.; DeBusk, M. M.; Mullins, D. R.; Stocks, G. M.; Yang, X. F.; Yoon, M.; Wu, Z. L., Single atom catalysis: CO oxidation on single Pt atoms supported on θ -alumina. Oral presentation at 244th ACS National Meeting, Philadelphia, PA, August 19-23, 2012.
118. Wu, Z. L.; Li, M. J.; Overbury, S. H., Are the Surfaces of Oxide Nanocrystals With Defined Facets as Perfect as They Appear? – A Case Study of Nanoshaped Ceria Catalysts. Poster presentation at 2012 CNMS User Meeting, Oak Ridge, TN, September 13, 2012.
119. Wu, Z. L.*; Schwartz, V.; Li, M. J.; Overbury, S. H., “Support Morphology Effect in Metal Oxide Catalysis: Vanadia supported on Ceria Nanoshapes for Iso-butane Oxidative Dehydrogenation.”, poster presentation at the *South East Catalysis Society Meeting*, Sept. 26-27, 2010, Ashville, SC.

120. Wu, Z. L.*; “*In situ/Operando* Raman Spectroscopy for Catalysis”, invited talk at *Workshop on Application of Raman Microscopy on Nanoscience*, Oct 22-23, 2010, Argonne, IL.
121. Formo, E. V.; Wu, Z. L.; Mahurin, S. M.; Dai, S., “Robust SERS Substrates Generated by Coupling a Bottom-Up Approach and Atomic Layer Deposition, and their Utilization Towards *in situ* Raman Studies at High Temperatures”, oral presentation at the *2010 MRS Fall Meeting*, Nov. 29 – Dec. 3, 2010, Boston, MA.
122. Wu, Z. L.*; Li, M. J.; Overbury, S. H., “On the surface dependent CO oxidation over ceria nanocrystals with defined surface planes”, poster presentation at *Gordon Research Conference on Chemical Reactions on Surfaces*, Feb 6-11, 2011, Ventura, CA.
123. Formo, E. V.; Wu, Z. L.; Mahurin, S. M.; Dai, S., “In situ high temperature surface enhanced Raman spectroscopy study of catalysis, oral presentation at *241st National Meeting and Exposition of the American-Chemical-Society*, MAR 27-31, 2011, Anaheim, CA.
124. Wu, Z. L.*; Schwartz, V.; Li, M. J.; Overbury, S. H., “Support Morphology Effect on Metal Oxide Catalysis: Vanadia Supported on Ceria Nanocrystals with Defined Surface Planes”, oral presentation at the *21st North American Catalysis Meeting*, June 5-10, 2011, Detroit, MI.
125. Li, M. J.; Wu, Z. L.; Overbury, S. H., “Surface structure dependence of selective oxidation activity in monofaceted CeO₂ nanoparticles”, poster presentation at the *21st North American Catalysis Meeting*, June 5-10, 2011, Detroit, MI.
126. Bauer, J. C.; Mullins, D.; Li, M. J.; Wu, Z. L.; Payzant, E. A.; Overbury, S. H.; Dai, S., “Synthesis, Characterization and Investigation of AuCu/SiO₂ as a Catalyst for CO Oxidation and Selective Oxidation of Ethanol”, oral presentation at the *21st North American Catalysis Meeting*, June 5-10, 2011, Detroit, MI.
127. Zhang, Z. Y.; More, K.; Sun, K.; Wu, Z. L.; Li, W. Z., “Nanoleaves as Highly Active Electrolyts for Oxygen Reduction Reaction in High pH Media”, oral presentation at the *21st North American Catalysis Meeting*, June 5-10, 2011, Detroit, MI.
128. Wu, Z. L.*; Dai, S.; Overbury, S. H., “Multi-wavelength Raman spectroscopic study of silica-supported vanadium oxide catalysts.”, poster presentation at the *South East Catalysis Society Meeting*, Sept. 27-28, 2009, Ashville, SC.
129. Li, M. J.; Wu, Z. L.; Ma, Z.; Dai, S.; Overbury, S. H.*; “Pathways for CO oxidation over phosphate supported Au catalysts”, oral presentation at 2009 AIChE Annual Meeting, November 8-13, 2009, Nashville, TN.
130. Wu, Z. L.*; “Vibrational Spectroscopy for Catalysis”, February 9, 2010, Oak Ridge, TN. Invited talk for “Introduction to Nanoscience and Technology” – a 3 credit cyber learning course sponsored by DOE Workforce Development for Teachers and Scientists (WDTS) Program and led by the Center for Nanophase Materials Sciences (CNMS) staff to target the distance learning initiative for minority serving institutions.
131. Overbury, S. H.*; Wu, Z. L.; Mullins, D. R.; Xu, Y.; Gordon, W. O.; Li, M. J., “Comparison of surface chemistry of CeO₂ surfaces by single crystal and nanocrystal approaches”, invited oral presentation at the *ACS 239th National Meeting*, March 21-25, 2010, San Francisco, CA.
132. Wu, Z. L.*; Schwartz, V.V.; Li, M. J.; Overbury, S. H., “Enhanced oxidative dehydrogenation performance of vanadia supported on ceria nanocrystals with well-defined surface plane”, poster presentation at 2010 Gordon Conference on Catalysis, June 27 – July 2, 2010.
133. Wu, Z. L.*; Li, M. J.; Overbury, S. H., “Surface dependence of defect sites on ceria nanocrystals probed by *in situ* vibrational spectroscopy”, invited oral presentation at the ACS 240th National Meeting, August 22-26, 2010, Boston, MA.
134. Wu, Z. L.*; Dai, S.; Overbury, S. H., “Operando infrared spectroscopy of low temperature CO oxidation on Au/SiO₂ catalyst”. Oral presentation at the *21st North American Catalysis Society Meeting*, June 7-12, 2009, San Francisco, CA.

135. Li, M. J.; Wu, Z. L.; Ma, Z.; Dai, S.; Overbury, S. H.*, "Reaction Mechanism for CO Oxidation over Iron Phosphate Supported Au Catalyst." Poster presentation at the *21st North American Catalysis Society Meeting*, June 7-12, 2009, San Francisco, CA.
136. Wu, Z. L.*; Wang, X. Q.; Pawel, M.; Dai, S.; Overbury, S. H., "Multi-wavelength Raman spectroscopic investigation of silica-supported vanadium oxide catalysts." Oral presentation at the *ACS 238th National Meeting*, August 16-20, 2009, Washington, DC.
137. Wu, Z. L.*; Zhou, S.; Zhu, H. G.; Dai, S.; Overbury, S. H., "On the Active Au Species for Low Temperature CO Oxidation on Au/SiO₂". Poster presentation at *South East Catalysis Society Meeting*, Sept. 28-29, 2008, Ashville, SC.
138. Li, M. J.; Wu, Z. L.*; Ma, Z.; Schwartz, V.; Mullins, D. R.; Dai, S.; Overbury, S. H., "Reaction Mechanisms for CO Oxidation over Iron Phosphate Supported Au Catalysts." Oral presentation at *South East Catalysis Society Meeting*, Sept. 28-29, 2008, Ashville, SC.
139. Wu, Z. L.*, "Operando Raman Spectroscopy for Catalysis." Oral presentation at the Raman Tutorial section of *2008 CNMS User Meeting*, Sept. 24-26, 2008, ORNL.