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RESEARCH INTERESTS

- Catalysis and electrocatalysis
- Liquid organic hydrogen carrier (LOHC) electrochemistry and applications
- Redox-mediated electrodialysis and electrochemical engineering
- Non-thermal plasma-assisted reactions and engineering

PROFESSORIAL EXPERIENCE

UNIVERSITY OF SOUTH CAROLINA Full Professor	COLUMBIA, SC 01/2023 - present
THE UNIVERSITY OF AKRON Full Professor	AKRON, OH 08/2021 - 12/2022
THE UNIVERSITY OF AKRON Associate Professor	AKRON, OH 08/2018 – 07/2021
THE UNIVERSITY OF AKRON Tenure-Track Assistant Professor	AKRON, OH 08/2012 - 07/2018
UNIVERSITY OF CALIFORNIA AT BERKELEY Postdoctoral Scholar (Mentor: Dr. Alexis T. Bell)	BERKELEY, CA 04/2010 - 07/2012

EDUCATION

UNIVERSITY OF ROCHESTER Ph.D. in Chemical Engineering (Advisor: Dr. Hong Yang) <i>Dissertation: "Platinum Alloy Nanoparticles: Composition, Shape, Structure and Electrocatalytic Property"</i> (http://hdl.handle.net/1802/12397)	ROCHESTER, NY 05/2010
UNIVERSITY OF SCIENCE AND TECHNOLOGY OF CHINA (USTC) M.S. in Materials Science and Engineering B.S. in Materials Science and Engineering	HEFEI, CHINA 06/2005 06/2002

RESEARCH EXPERIENCES

UNIVERSITY OF SOUTH CAROLINA Department of Chemical Engineering	COLUMBIA, SC 01/2023 - Present
• Electrochemical methods for hydrogen generation, storage, and utilization • New electrochemical approach for energy storage • Advanced catalyst materials for chemical and electrochemical reactions	

- Electrochemical engineering for environmental, chemical separation, critical materials recovery applications
- Nonthermal plasma process and engineering for polymer upcycling and biomass conversion

THE UNIVERSITY OF AKRON

AKRON, OH

Department of Chemical, Biomolecular, and Corrosion Engineering

08/2012 - Present

- Development of cost-effective, active, and stable catalysts for hydrogen economy-related reactions, including fuel cell reaction, water electrolysis, and electrochemical hydrogen storage reactions.
- Development of electrode/redox materials for efficient, high-capacity, low-cost electrochemical desalination.
- Exploration of new catalyst to realize CO₂ hydrogenation to methanol and dimethyl ether under mild condition.
- Identification of catalysis descriptors for metals and metal oxides and establishment of the relationships with the activity property.
- Mechanistic studies of selective conversion of light alkane on catalyst surface.

UNIVERSITY OF CALIFORNIA AT BERKELEY

BERKELEY, CA

Department of Chemical and Biomolecular Engineering

04/2010 – 07/2012

- Mechanistic study of coking mechanism of Pt-based catalysts in light alkane dehydrogenation.

UNIVERSITY OF ROCHESTER

ROCHESTER, NY

Department of Chemical Engineering

2005 - 2010

- Preparation of Pt-on-metal heterojunction nanoparticles and study of the catalytic properties in ORR.
- Exploration of “composition-forbidden” Pt alloy nanoparticles as new catalysts in MOR and FAOR.

UNIVERSITY OF SCIENCE AND TECHNOLOGY OF CHINA

HEFEI, CHINA

Hefei National Laboratory for Physical Sciences at the Microscale

2002 - 2005

- Investigation of the formation mechanism of magnetite nanostructures via beta-FeOOH reduction.

TEACHING RECORD

<i>Semester</i>	<i>Course Name</i>	<i>Course#</i>	<i>Student#</i>	<i>Evaluation</i>
2026 Spring	Chemical Reaction Kinetics (UG/G)	ECHE430/530	39/2	4.14
2025 Fall	Computational Methods for Engineering Applications (UG)	ECHE456	26	4.67
2025 Spring	Chemical Reaction Kinetics (UG/G)	ECHE430/530	43/0	4.79
2024 Fall	Computational Methods for Engineering Applications (UG)	ECHE456	21	4.67
2024 Spring	Chemical Reaction Kinetics (UG/G)	ECHE430/530	14/1	4.50/5.00
2023 Fall	Chemical Reaction Kinetics (UG/G)	ECHE430/530	13/1	5.00/4.00
2022 Fall	Chemical Reaction Engineering (G)	4200:605:801	3	5
2022 Spring	Chemical Reaction Engineering (UG)	4200:330:001	44	3.814
2021 Fall	Chemical Reaction Engineering (G)	4200:605:801	6	NA
2021 Spring	Chemical Engineering Seminar (G)	4200:791:001	14	4.725
2021 Spring	Chemical Reaction Engineering (UG)	4200:330:001	50	4.009
2020 Fall	Chemical Reaction Engineering (G)	4200:605:801	7	4.738
2020 Fall	Chemical Engineering Seminar (G)	4200:791:001	16	4.791

2020 Spring	Chemical Reaction Engineering (UG)	4200:330:001	46	NA
2019 Fall	Chemical Reaction Engineering (G)	4200:605:801	18	4.262
2019 Spring	Heterogeneous Catalysis (UG/G)	4200:680:001	10	4.769
2019 Spring	Chemical Reaction Engineering (UG)	4200:330:001	56	3.519
2018 Fall	Chemical Reaction Engineering (G)	4200:605:801	19	4.632
2018 Spring	Heterogeneous Catalysis (UG/G)	4200:680:001	6	4.438
2018 Spring	Chemical Reaction Engineering (UG)	4200:330:001	67	3.706
2017 Fall	Chemical Reaction Engineering (G)	4200:605:801	17	4.599
2017 Spring	Heterogeneous Catalysis (UG/G)	4200:680:001	7	4.885
2017 Spring	Chemical Reaction Engineering (UG)	4200:330:001	69	4.153
2016 Fall	Chemical Reaction Engineering (G)	4200:605:801	15	4.671
2016 Spring	Heterogeneous Catalysis (UG/G)	4200:680:001	5	4.857
2016 Spring	Chemical Reaction Engineering (UG)	4200:330:001	44	4.569
2015 Fall	Chemical Reaction Engineering (G)	4200:605:801	19	4.652
2015 Spring	Heterogeneous Catalysis (UG/G)	4200:680:001	7	5.000
2015 Spring	Chemical Reaction Engineering (UG)	4200:330:001	35	3.878
2014 Fall	Chemical Reaction Engineering (G)	4200:605:801	25	4.627
2014 Spring	Chemical Reaction Engineering (UG)	4200:330:001	47	3.835
2013 Fall	Chemical Engineering Seminar (G)	4200:791:001	44	4.484
2013 Fall	Chemical Reaction Engineering (G)	4200:605:801	24	4.415
2013 Spring	Chemical Engineering Seminar (G)	4200:791:001	34	4.336
2013 Spring	Chemical Engineering Lab (UG)	4200:360:011	30	3.560
2012 Fall	Chemical Reaction Engineering (G)	4200:605:801	26	4.474

FUNDED RESEARCH PROJECTS

	<i>Project Title</i>	<i>Sponsor</i>	<i>Role</i>	<i>Amount</i>
30.	Characterization of Electrocatalytic Systems (03/2026-02/2028)	SRNL/DOE	PI	\$30,000
29.	Flow-cell Assisted Ion Removal and Recovery (FAIR2) Technology for Efficient Nutrient Management of Hydroponic Wastewater (08/2025-04/2026)	WaterUS LLC/USDA	PI	\$35,000
28.	Collaborative Research: FEC: Tri-State Collaborative for Defluorination of Per- and Polyfluoroalkyl Substances (PFAS) (09/2025-08/2029)	NSF	PI	\$1.2M
27.	Electromagnetic-Assisted Electrochemical Conversion of CO ₂ to High Value Chemicals (04/2025-04/2028)	SRNL/DOE	KP	\$100,000/450,000
26.	SBIR Phase I: Flow-cell Assisted Softening Technology (FAST) for Whole Home Water Treatment (05/2024-04/2025)	WaterUS LLC/NSF	PI	\$70,000

25.	Start-up Fund for professorship (01/2023 – 12/2026)	USC	PI	\$427,500
24.	EFRI E3P: Nonthermal Plasma-Assisted Hydrogenolysis of Waste Plastics to Value-Added Chemicals and Fuels (Award No: 2132178, 10/2021 -09/2026)	NSF	co-PI	\$2M
23.	Electrochemical Water Desalination Technology (04/2021 – 03/2022)	NSF UA I-Corps Sites Team Program	PI	\$2,500
22.	Cascade Adsorption Mechanism for Overcoming Activation Energy Barrier in Oxygen Reduction Reaction (annually renewed, 03/2021 – 12/2023)	Toyota Motor Engineering & Manufacturing North America Inc.	PI	\$150,000
21.	Dual-Site Relay Catalysis in Oxygen Reduction Reactions on Reducible Metal Oxide Heterojunction Structures (Award No: 1955452, 05/2020 – 06/2024)	NSF	PI	\$350,817
20.	Cascade Adsorption Mechanism for Overcoming Activation Energy Barrier in Oxygen Reduction Reaction (annually renewed, 03/2020 – 02/2021)	Toyota Motor Engineering & Manufacturing North America Inc.	PI	\$100,000
19.	Active and Durable Alkaline Water Electrolyzer for Cost-effective and Renewable Hydrogen Production (06/2019 – 06/2020)	NSF	PI	\$50,000
18.	Carbon Dioxide Reduction to Dimethyl Ether as Diesel Alternative (05/2019 – 04/2020)	FRC Research Fellowship, UA	PI	\$10,000
17.	Electrochemical Water Energy (10/2018 – 09/2019)	UA NSF I-Corps Sites program	PI	\$2,500
16.	Cascade Adsorption Mechanism for Overcoming Activation Energy Barrier in Oxygen Reduction Reaction (annually renewed, 03/2019 – 02/2020)	Toyota Motor Engineering & Manufacturing North America Inc.	PI	\$90,000
15.	Solid-State Synthesis and Characterization of Octahedral Pt-based Alloys on Mesoporous Carbon Support (annually renewed, 03/2019 – 02/2020)	Toyota Motor Engineering & Manufacturing North America Inc.	PI	\$60,000
14.	Cascade Adsorption Mechanism for Overcoming Activation Energy Barrier in Oxygen Reduction Reaction (03/2018 – 02/2019)	Toyota Motor Engineering & Manufacturing North America Inc.	PI	\$50,000
13.	Solid-State Synthesis and Characterization of Octahedral Pt-based Alloys on Mesoporous Carbon Support (annually renewed, 03/2018 – 02/2019)	Toyota Motor Engineering & Manufacturing North America Inc.	PI	\$95,000
12.	Solid-State Synthesis and Characterization of Octahedral Pt-based Alloys on Mesoporous Carbon Support (09/2017 – 02/2018)	Toyota Motor Engineering & Manufacturing North America Inc.	PI	\$30,000
11.	Mechanistic Insights into Covalent and Ionic Contributions to Molecular Adsorption and Reaction on Transition Metals (Award No.: 1665265, 08/2017 – 07/2020)	National Science Foundation	PI	\$311,847

10.	Data-Assisted Discovery of Active and Durable Oxygen Reduction Electrocatalyst for Fuel Cell Application (05/2017 – 04/2018)	Firestone Research Fellowship, UA	PI	\$10,000
9.	Pt-based Catalyst Materials for Activity and Stability Evaluation for Oxygen Reduction Reaction (03/2017 – 02/2018)	Toyota Motor Engineering & Manufacturing North America Inc.	PI	\$10,000
8.	Catalyst Development for Low-Cost CO ₂ Reduction to Methanol (Award No.: R-16-04, 09/2016 – 12/2018)	Ohio Development Services Agency	PI	\$194,259
7.	Renewable Hydrogen Production via Photocatalytic Water Splitting (05/2016 – 04/2017)	FRC Research Fellowship, UA	PI	\$10,000
6.	Safe, Highly Energy and Performance Sodium-Oxygen Battery (04/2015 – 08/2016)	NASA Glenn Research Center	co-PI	\$15,000/\$50,000
5.	Scale-Up Technology Development for Low-Cost and Long-Durability Catalytic Electrodes in PEMFCs (08/2015 – 07/2016)	Bing Energy International LLC	PI	\$40,000
4.	Research Nitrogen-Functionalized Polymer-Supported Palladium Catalyst for Aqueous Phase Production of Cyclohexanone (07/2014 – 06/2015)	FRC Research Fellowship, UA	PI	\$10,000
3.	Method to Produce Metal Alloy Catalysts (12/2013 – 05/2014)	NSF UA I-Corps Sites Team Program	PI	\$2,500
2.	Engineering Scalable Production of Cubic Platinum/Carbon Catalysts and the Application in Electrocatalytic Oxidation of Ammonia (05/2013 – 04/2014)	Firestone Research Fellowship, UA	PI	\$10,000
1.	Start-up Fund for assistant professorship (08/2012 – 06/2018)	UA	PI	\$472,000

JOURNAL ARTICLES (*: Corresponding author)

1. A. C. Gibson, **Z. M. Peng**, J. H. Jiang*, Advanced in Carbon-Nitrogen Bond Formation From CO₂ and Nitrogenous Small Molecules Through Tandem Electrocatalysis, *Chemistry – A European Journal*, 2026, DOI: 10.1002/chem.71294.
2. P. Pishva, J. Tang, Y. Zhu, J. Lauterbach, **Z. M. Peng***, Highly Energy-Efficient Hydrogenolysis of High-Density Polyethylene via Hydrogen Nonthermal Plasma Reaction Engineering, *Green Chemistry*, 2025, 27, 15161.
3. J. Tang, X. Shen, L. Newsom, R. Xie, P. Pishva, Y. Zhu, B. Liu, **Z. M. Peng***, Isopropanol Electro-Oxidation on PtCu Alloys for Aqueous Organic Redox Chemistry Toward Energy Storage, *Molecules*, 2025, 30, 4027.
4. Y. Zhu, J. Tang, P. Pishva, **Z. M. Peng***, Hierarchical dual-metal design of Pt₃Ni₁-Au catalysts for enhanced activity and stability in ethylamine electro-oxidation, *Cell Reports Physical Science*, 2025, 6, 102869.
5. P. Pishva, A. H. Mokarizadeh, R. Xie, J. Tang, X. Shen, Y. Zhu, M. Tsige, **Z. M. Peng***, The hydrolysis properties of polyethylene glycol under ambient nonthermal plasma conditions, *Energy Advances*, 2025, 4, 1375-1382.
6. J. Tang, J. Li, D. Wu, R. Xie, **Z. M. Peng***, Ethylamine as a regenerative fuel for emission-free direct liquid fuel cell, *Next Materials*, 2025, 6, 100398.

7. P. Pishva, J. Li, R. Xie, J. Tang, P. Nandy, T. Farouk, J. Guo, **Z. M. Peng***, Nonthermal hydrogen plasma-enabled ambient, fast lignin hydrogenolysis to valuable chemicals and bio-oils, *Chemical Engineering Journal*, 2024, *501*, 157776.
8. R. Xie, D. Sun, J. Tang, X. Shen, P. Pishva, Y. Zhu, K. Huang*, **Z. M. Peng***, Ecofriendly, Highly Selective Lithium Extraction by Redox-Mediated Electrodialysis, *ACS Central Science*, 2024, *10* (11), 2119-2124.
9. A. Alkhaldi, A. Alsultan, **Z. M. Peng***, Selective, Efficient Removal and Recovery of Phosphate from Wastewater by Promoting the Mass Transfer with Anion Exchange Resin in Redox Flow Deionization Cell, *ACS Sustainable Resource Management*, 2024, *1* (7), 1475-1484.
10. J. Li, J. Tang, P. Pishva, **Z. M. Peng***, Direct Liquid Fuel Cell Using Cyclohexanol as Regenerative Fuel for Emission-Free Energy Generation, *Energy & Fuels*, 2024, *38* (14), 13327-13332.
11. R. Xie, B. R. Schrage, J. Jiang, C. J. Ziegler*, **Z. M. Peng***, Ferrocene Bis (Sulfonate) Salt as Redoxmer for Fast and Steady Redox Flow Desalination, *Molecules*, 2024, *29* (11), 2506.
12. Y. Zhu, D. Wu, J. Y. Tang, D. Braaten, B. Liu, **Z. M. Peng***, Advances in electrocatalytic dehydrogenation of ethylamine to acetonitrile, *Chemical Communications*, 2024, *60* (68), 9007-9021.
13. J. T. Tang, R. X. Xie, P. Pishva, X. C. Shen, Y. L. Zhu, **Z. M. Peng***, Recent progress and perspectives of liquid organic hydrogen carrier electrochemistry for energy applications, *Journal of Materials Chemistry A*, 2024, *12*, 15580-15591.
14. D. Z. Wu, L. Q. Zhou, X. C. Shen, H. F. Jia, **Z. M. Peng***, MoO₃-Pt(CuNi)_x Heterojunction Nanostructured Catalyst for Promoting the Oxygen Reduction Reaction Activity Property, *Catalysis Communications*, 2024, *186*, 106835.
15. J. Y. Tang, J. L. Li, P. Pishva, R. X. Xie, **Z. M. Peng***, Aqueous, Rechargeable Liquid Organic Hydrogen Carrier Battery for High-Capacity, Safe Energy Storage, *ACS Energy Letters*, 2023, *8*, 3727-3732.
16. J. L. Li, J. Y. Tang, D. Z. Wu, L. B. Yao, **Z. M. Peng***, The Properties of Ethylamine Dehydrogenation and Electrolysis using Platinum Catalyst for Efficient, Ambient Hydrogen Production, *International Journal of Hydrogen Energy*, 2023, *48*, 36286-36294.
17. S. S. C. Chuang*, F. Hube, A. Oduntan, **Z. M. Peng**, Transient Responses of Product Formation in Nonthermal Plasma-Assisted D₂O-CO₂-Rubber Reaction, *Catalysis Communications*, 2023, *180*, 106707.
18. A. Alkhaldi, A. Alsultan, K. Alsaikhan, R. X. Xie, J. L. Li, **Z. M. Peng***, Removal and Recovery of Ammonium and Phosphate from Wastewater Using a Redox Flow Deionization Cell (RFDC), *ACS ES&T Water*, 2023, *3*, 1182-1191. (ACS Editors' Choice)
19. A. Alsultan, A. Alkhaldi, K. Alsaikhan, J. L. Li, R. X. Xie, **Z. M. Peng***, Surface-Treated Carbon Black for Durable, Efficient, Continuous Flow Electrode Capacitive Deionization, *Separation and Purification Technology*, 2023, *313*, 123444.
20. J. L. Li, **Z. M. Peng***, Recent Advances of Reducible Metal Oxide Catalysts in C1 Reactions, *Catalysis Science & Technology*, 2023, *13*, 28-40. (Front cover)
21. R. X. Xie, D. Q. Yue, **Z. M. Peng***, X. L. Wei*, Achieving Energy-Saving, Continuous Redox Flow Desalination with Iron Chelate Redoxmers, *Energy Material Advances*, 2023, *4*, 0009.
22. K. Alsaikhan, A. Alsultan, A. Alkhaldi, A. Bentalib, A. Abutalib, D. Z. Wu, J. L. Li, R. X. Xie, **Z. M. Peng***, Carbon Material-Based Flow-Electrode Capacitive Deionization for Continuous Water Desalination, *Processes*, 2023, *11*, 195.
23. J. L. Li, L. B. Yao, D. Z. Wu, J. King, S. S. C. Chuang, B. Liu, **Z. M. Peng***, Electrocatalytic Methane Oxidation to Ethanol on Iron-Nickel Hydroxide Nanosheets, *Applied Catalysis B: Environmental*, 2022, *316*, 121657.
24. L. B. Yao, Y. B. Pan, D. Z. Wu, A. Bentalib, J. L. Li, B. Liu, **Z. M. Peng***, Balancing CO Chemisorption with Hydrogen Electrochemical Adsorption on Pt Alloy Catalyst for Improving Direct CO Reduction to Formaldehyde, *Chemical Engineering Journal*, 2022, *446*, 137131.

25. L. B. Yao, J. King, D. Z. Wu, J. Y. Ma, J. L. Li, R. X. Xie, S. S. C. Chuang, T. Miyoshi, **Z. M. Peng***, Non-thermal Plasma-assisted Rapid Hydrogenolysis of Polystyrene to High Yield Ethylene, *Nature Communications*, 2022, 13, 885.
26. X. Zhao, X. Li, L. An, K. Iputera, J. Zhu, P. Gao, R. S. Liu, **Z. M. Peng***, J. L. Yang*, D. L. Wang*, Nitrogen-Inserted Nickel Nanosheets with Controlled Orbital Hybridization and Strain Fields for Boosted Hydrogen Oxidation in Alkaline Electrolytes, *Energy & Environmental Science*, 2022, 15, 1234-1242.
27. D. Z. Wu, L. B. Yao, M. Ricci, J. L. Li, R. X. Xie, **Z. M. Peng***, Ambient Synthesis of Pt-Reactive Metal Alloy and High-Entropy Alloy Nanocatalysts Utilizing Hydrogen Cold Plasma, *Chemistry of Materials*, 2022, 34, 266-272.
28. D. Z. Wu, J. L. Li, L. B. Yao, R. X. Xie, **Z. M. Peng***, An Electrochemical Ethylamine/Acetonitrile Redox Method for Ambient Hydrogen Storage, *ACS Applied Materials & Interfaces*, 2021, 13, 55292-55298.
29. L. B. Yao, Y. B. Pan, D. Z. Wu, J. L. Li, R. X. Xie, **Z. M. Peng***, Approaching Full-Range Selectivity Control in CO₂ Hydrogenation to Methanol and Carbon Monoxide with Catalyst Composition Regulation, *Inorganic Chemistry Frontiers*, 2021, 8, 2433-2441. (Cover Art)
30. J. L. Li, X. C. Shen, Y. B. Pan, **Z. M. Peng***, Fingerprinting Ammonia Synthesis Pathway using Spatiotemporal Electrostatic Potential Distribution of Intermediates, *ACS Omega*, 2021, 6, 6292-6296. (Front Cover)
31. L. B. Yao, J. King, D. Z. Wu, S. S. C. Chuang, **Z. M. Peng***, Non-Thermal Plasma-Assisted Hydrogenolysis of Polyethylene to Light Hydrocarbons, *Catalysis Communications*, 2021, 150, 106274.
32. Y. B. Pan, L. B. Yao, A. Bentalib, J. L. Li, **Z. M. Peng***, Sulfonated Nickel Phthalocyanine Redox Flow Cell for High-Performance Electrochemical Water Desalination, *Desalination*, 2020, 496, 114762.
33. L. B. Yao, X. C. Shen, Y. B. Pan, **Z. M. Peng***, Unravelling Proximity-Driven Synergetic Effect within CIZO–SAPO Bifunctional Catalyst for CO₂ Hydrogenation to DME, *Energy & Fuels*, 2020, 34, 8635-8643.
34. W. Q. Han, Z. H. Liu, Y. B. Pan, G. N. Guo, J. X. Zou, Y. Xia, **Z. M. Peng**, W. Li, A. G. Dong*, Designing Champion Nanostructures of Tungsten Dichalcogenides for Electrocatalytic Hydrogen Evolution, *Advanced Materials*, 2020, 2002584.
35. L. B. Yao, Y. B. Pan, X. C. Shen, D. Z. Wu, A. Bentalib, **Z. M. Peng***, Utilizing Hydrogen Underpotential Deposition in CO Reduction for Highly Selective Formaldehyde Production under Ambient Condition, *Green Chemistry*, 2020, 22, 5639-5647. (Back Cover)
36. D. Z. Wu, X. C. Shen, L. Q. Zhou, T. Nagai, Y. B. Pan, L. B. Yao, B. Zulevi, A. Lubers, H. F. Jia*, **Z. M. Peng***, A Vacuum Impregnation Method for Synthesizing Octahedral Pt₂CuNi Nanoparticles on Mesoporous Carbon Support and the Oxygen Reduction Reaction Electrocatalytic Properties, *Journal of Colloid and Interface Science*, 2020, 564, 245-253.
37. Y. B. Pan, X. C. Shen, M. Holly, L. B. Yao, D. Z. Wu, A. Bentalib, J. L. Yang, J. Zeng, **Z. M. Peng***, Oscillation of Work Function during Reducible Metal Oxide Catalysis and Correlation with the Activity Property, *ChemCatChem*, 2020, 12, 85-89.
38. A. Bentalib, Y. B. Pan, L. B. Yao, **Z. M. Peng***, Properties of Amorphous Iron Phosphate in Pseudocapacitive Sodium Ion Removal for Water Desalination, *RSC Advances*, 2020, 10, 16875-16880.
39. D. Z. Wu, X. C. Shen, Y. B. Pan, L. B. Yao, **Z. M. Peng***, Advances, Challenges and Perspectives of Platinum Alloy Catalysts for Oxygen Reduction Reaction, *ChemNanoMat*, 2020, 6, 32-41. (Invited Review Article)
40. X. C. Shen, S. Dai, Y. B. Pan, L. B. Yao, J. L. Yang, X. Q. Pan, J. Zeng, **Z. M. Peng***, Tuning Electronic Structure and Lattice Diffusion Barrier of Ternary Pt-In-Ni for Both Improved Activity and Stability Properties in Oxygen Reduction Electrocatalysis, *ACS Catalysis*, 2019, 9, 11431-11437.

41. L. Gao, X. X. Li, Z. Y. Yao, H. J. Bai, Y. F. Lu, C. Ma, S. F. Lu, **Z. M. Peng***, J. L. Yang, A. L. Pan, H. W. Hang*, Unconventional p-d Hybridization Interaction in PtGa Ultrathin Nanowires Boosts Oxygen Reduction Electrocatalysis, *Journal of the American Chemical Society*, 2019, *141*, 18083-18090.
42. J. H. Li, Z. Q. Liu, D. A. Cullen, W. H. Hu, J. R. Huang, L. B. Yao, **Z. M. Peng**, P. L. Liao, R. G. Wang*, Distribution and Valence State of Ru Species on CeO₂ Supports: Support Shape Effect and Its Influence on CO Oxidation, *ACS Catalysis*, 2019, *9*, 11088-11103.
43. F. Hu, Y. Zhang, X. C. Shen, J. Tao, X. W. Yang, Y. J. Xiong*, **Z. M. Peng***, Porous amorphous NiFeOx/NiFeP framework with dual electrocatalytic functions for water electrolysis, *Journal of Power Sources*, 2019, *428*, 76-81.
44. F. P. Yang, D. Presto, Y. B. Pan, K. Liu, L. Zhou, S. Narayanan, Y. Zhu, **Z. M. Peng**, M. D. Soucek, M. Tsige, M. D. Foster*, Proximity to Graphene Dramatically Alters Polymer Dynamics, *Macromolecules*, 2019, *52*, 5074-5085.
45. B. W. Wang, J. X. Zou, X. C. Shen, Y. C. Yang, G. Z. Hu, W. Li, **Z. M. Peng***, D. Banham*, A. G. Dong*, D. Y. Zhao, Nanocrystal supracrystal-derived atomically dispersed Mn-Fe catalysts with enhanced oxygen reduction activity, *Nano Energy*, 2019, *63*, 103851.
46. X. C. Shen, T. Nagai, F. P. Yang, L. Q. Zhou, Y. B. Pan, L. B. Yao, D. Z. Wu, Y. S. Liu, J. Feng, J. H. Guo, H. F. Jia*, **Z. M. Peng***, Dual-site cascade oxygen reduction mechanism on SnOx/Pt-Cu-Ni for promoting reaction kinetics, *Journal of the American Chemical Society*, 2019, *141*, 9463-9467.
47. F. Hu, H. Y. Wang, Y. Zhang, X. C. Shen, G. H. Zhang, Y. B. Pan, J. T. Miller, K. Wang, S. L. Zhu, X. J. Yang, C. M. Wang, X. J. Wu*, Y. J. Xiong*, **Z. M. Peng***, Designing Highly Efficient and Long-Term Durable Electrocatalyst for Oxygen Evolution by Coupling B and P into Amorphous Porous NiFe-Based Material, *Small*, 2019, *1901020*.
48. L. B. Yao, X. C. Shen, Y. B. Pan, **Z. M. Peng***, Synergy between active sites of Cu-In-Zr-O catalyst in CO₂ hydrogenation to methanol, *Journal of Catalysis*, 2019, *372*, 74-85.
49. H. F. Feng, S. Y. Gao, J. Shi, L. Zhang*, **Z. M. Peng***, S. K. Cao*, Construction of 3D hierarchical porous NiCo₂O₄/graphene hydrogel/Ni foam electrode for high-performance supercapacitor, *Electrochimica Acta*, 2019, *299*, 116-124.
50. Y. B. Pan, X. C. Shen, L. B. Yao, A. Bentalib, J. L. Yang, J. Zeng*, **Z. M. Peng***, Competitive Transient Electrostatic Adsorption for In Situ Regeneration of Poisoned Catalyst, *ChemCatChem*, 2019, *11*, 1179-1184.
51. X. C. Shen, S. Dai, S. Y. Zhang, Z. Lu, C. L. Zhang, G. W. Graham, Y. Lei, X. Q. Pan*, **Z. M. Peng***, Oxidation-Induced Atom Diffusion and Surface Restructuring in Faceted Ternary Pt-Cu-Ni Nanoparticles, *Chemistry of Materials*, 2019, *31*, 1720-1728.
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BOOK CHAPTERS

1. X. K. Kong*, **Z. M. Peng***, Inorganic Two-Dimensional Nanomaterials for Electrocatalysis, In *Inorganic Two-Dimensional Nanomaterials*, C. Z. Wu (Ed.), Royal Society of Chemistry, 2017, Chapter 9, 241 - 265.
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INVITED TALKS, CONFERENCE PRESENTATIONS (Underline: presenter)

1. Parsa Pishva, Zhenmeng Peng*, Non-Thermal Plasma-Activated Hydrocracking of Polyethylene to Light Hydrocarbons, ACS Spring Meeting, Atlanta, GA, 2026. (invited talk)
2. Zhenmeng Peng*, Rongxuan Xie, Kevin Huang, Ecofriendly, Highly Selective Lithium Extraction by Redox-Mediated Electrodialysis, International Conference on Desalination Science and Technology (DESAL 2025), Clearwater Beach, FL, 2025.
3. Zhenmeng Peng*, Abdulrahman Alkhalidi, Abdullah Alsultan, Redox-Mediated Electrodialysis for Removal and Recovery of Ammonium and Phosphate from Wastewater, International Conference on Desalination Science and Technology (DESAL 2025), Clearwater Beach, FL, 2025.
4. Abdulrahman Alkhalidi, Abdullah Alsultan, Zhenmeng Peng*, Redox-Mediated Electrodialysis for Removal and Recovery of Ammonium and Phosphate from Wastewater, 247th ECS Meeting, Montreal, Canada, 2025.
5. Yanlin Zhu, Jinyao Tang, Zhenmeng Peng*, Enabling Ethylamine as An Electrochemical Liquid Organic Hydrogen Carrier, 247th ECS Meeting, Montreal, Canada, 2025.
6. Z. M. Peng*, Enabling Ethylamine as an Electrochemical Liquid Organic Hydrogen Carrier, 10th Asia-Pacific Congress on Catalysis (APCAT-10), Singapore, 2025. (invited talk)
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8. Z. M. Peng*, Removal and Recovery of Ammonium and Phosphate from Wastewater Using a Redox Flow Deionization Cell, AIChE Annual Meeting, San Diego, CA, 2024.
9. Z. M. Peng*, Non-Thermal Plasma-Assisted Hydrogenolysis of Waste Plastics to Light Hydrocarbons, AIChE Annual Meeting, San Diego, CA, 2024.
10. Z. M. Peng*, Enabling Ethylamine As Liquid Organic Hydrogen Carrier for Ambient Hydrogen Storage, Renewable Hydrogen Storage and Transport Conference (THST24), University of South California, CA, 03/11-03/12/2024.
11. Z. M. Peng*, Electrochemical Ethylamine Dehydrogenation to Acetonitrile on Platinum-based Catalysts, Southeastern Catalysis Society 23rd Annual Symposium, Georgia Institute of Technology, GA, 02/12-02/13, 2024.
12. D. Z. Wu, J. L. Li, J. Y. Tang, Z. M. Peng*, Electrochemical Ethylamine Dehydrogenation to Acetonitrile on Platinum-based Catalysts, ACS Fall Meeting, San Francisco, CA, 2023.
13. Z. M. Peng*, Electrochemical Technologies and Related Catalyst Research in Hydrogen Economy Development, Chemistry Department, University of South Carolina, 04/17/2023. (invited talk)
14. Z. M. Peng*, Electrochemical Technologies and Related Catalyst Research for Developing a Hydrogen Economy, Kansas State University, 11/02/2022. (invited talk)
15. D. Z. Wu, J. L. Li, L. B. Yao, R. X. Xie, Z. M. Peng*, An Electrochemical Ethylamine/Acetonitrile Redox Method for Ambient Hydrogen Storage, ACS Fall Meeting, Chicago, IL, 2022.
16. D. Z. Wu, J. L. Li, L. B. Yao, R. X. Xie, Z. M. Peng*, An Electrochemical Ethylamine/Acetonitrile Redox Method for Ambient Hydrogen Storage, 241st ECS Meeting, Vancouver, BC, Canada, 2022.
17. D. Z. Wu, X. C. Shen, Y. B. Pan, L. B. Yao, Z. M. Peng*, Reducible Metal Oxide/Platinum Alloy Dual-Site Catalytic Structure for Promoting Oxygen Reduction Reaction Kinetics, NAM 27, New York City, NY, 2022.
18. Z. M. Peng*, Catalyst Research for Hydrogen Economy-Related Electrochemical Reactions, University of Maryland College Park, 11/23/2021. (invited talk)
19. L. B. Yao, Y. B. Pan, X. C. Shen, D. Z. Wu, A. Bentalib, Z. M. Peng*, Utilizing Hydrogen Underpotential Deposition for Carbon Monoxide Reduction to Formaldehyde, 240th Virtual ECS Meeting. (oral presentation)
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22. L. B. Yao, Y. B. Pan, X. C. Shen, D. Z. Wu, A. Bentalib, Z. M. Peng*, Utilizing Hydrogen Underpotential Deposition for Carbon Monoxide Reduction to Formaldehyde, 2021 Virtual ACS Fall Meeting. (oral presentation)
23. Z. M. Peng*, Research of Platinum-Based Oxygen Reduction Reaction Catalyst for Fuel Cell Application, Department of Mechanical and Energy Engineering, Indiana University-Purdue University Indianapolis, 04/15/2021. (invited seminar)
24. Z. M. Peng*, Research of Platinum-Based Oxygen Reduction Reaction Catalyst for Fuel Cell Application, Department of Chemical Engineering, University of Illinois at Chicago, 03/11/2021. (invited seminar)
25. Z. M. Peng*, Electrocatalyst Research for Active and Durable Oxygen Evolution Reaction, School of Polymer Science and Polymer Engineering, the University of Akron, 10/09/2020. (invited seminar)
26. Z. M. Peng*, Redox Flow-Based Electrochemical Water Desalination, 2020 Virtual MRS Spring/Fall Meeting. (invited presentation)
27. L. B. Yao, X. C. Shen, Y. B. Pan, Z. M. Peng*, Synergy between Different Active Sites in Affecting CO₂ Hydrogenation Kinetics and Selectivity, AIChE Annual Meeting, Orlando, FL, 10/2019. (oral presentation)
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29. Z. M. Peng*, Electrocatalyst Research for Active and Durable Oxygen Evolution Reaction, Michigan Catalysis Society Meeting, Livonia, MI, 10/2019. (invited talk)
30. Z. M. Peng*, Toward More Accurate Depiction of Chemical - Active Site Interactions using Catalyst Material Parameters, ACS Spring Meeting, Orlando, FL, 04/2019. (invited presentation)
31. Z. M. Peng*, Electrocatalyst Development for Active and Durable Oxygen Evolution Reaction, AIChE Annual Meeting, Pittsburgh, PA, 10/2018. (invited presentation)
32. Z. M. Peng*, Overcoming Activation Energy Barrier in Oxygen Reduction Reaction, Toyota Fuel Cell Research Workshop, Torrance, CA, 10/2018. (invited presentation)
33. Z. M. Peng*, Nitrogen-doped Ordered Mesoporous Carbon/Graphene Framework as Dual Electrocatalyst for Oxygen Reduction and Evolution Reactions, MS&T Conference, Columbus, OH, 2018. (invited presentation)
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35. Zhenmeng Peng*, Platinum Alloy Nanocatalyst with Manipulated Particle Composition and Morphology for Improved ORR Properties, Electrochemical Energy Science and Technology Meeting, Niagara Falls, Canada, 08/2018.
36. Zhenmeng Peng*, Research and Development of Electrocatalyst for Water Electrolysis, Anhui University, Hefei, China, 07/17/2018. (invited talk)
37. Zhenmeng Peng*, Towards Active and Durable Electrocatalyst Development for Oxygen Evolution Reaction, Fudan University, Shanghai, China, 07/12/2018. (invited seminar)
38. Zhenmeng Peng*, Two-Dimensional Metal-Organic Framework Nanosheets for Electrochemical and Photoelectrochemical Water Oxidation, 2017 MS&T Conference, Pittsburgh, PA, 2017 (invited talk).
39. Changlin Zhang, Biwei Wang, Angang Dong, Zhenmeng Peng*, Nitrogen-doped Ordered Mesoporous Carbon/Graphene Framework as Dual Electrocatalyst for Oxygen Reduction and Evolution Reactions, 232nd ECS Meeting, National Harbor, MD, 2017 (oral presentation).

40. Zhenmeng Peng*, Platinum Alloy Nanocatalyst with Manipulated Particle Composition and Morphology for Improved ORR Properties, Zhengzhou University, Zhengzhou, China, 07/29/2017 (invited talk).
41. Zhenmeng Peng*, Platinum Alloy Nanocatalyst with Manipulated Particle Composition and Morphology for Improved ORR Properties, Institute of Solid State Physics, Chinese Academy of Science, Hefei, China, 07/24/2017 (invited talk).
42. Yanbo Pan, Sang Youp Hwang, Xiaochen Shen, Eric Yurchekfrodl, Zhenmeng Peng*, Computation-Aided Development of Platinum Alloy Catalysts for Carbon Monoxide Preferential Oxidation, NAM 25, Denver, CO, 2017 (oral presentation).
43. Changlin Zhang, Sang Youp Hwang, Zhenmeng Peng*, Platinum Alloy Nanocatalyst with Manipulated Particle Composition and Morphology for Improved ORR Property, ACS 253rd National Meeting, San Francisco, CA, 2017 (oral presentation).
44. Sang Youp Hwang, Yanbo Pan, Xiaochen Shen, Eric Yurchekfrodl, Zhenmeng Peng*, Tuning carbon monoxide preferential oxidation properties on platinum alloy nanoparticle catalyst via engineering the active sites, ACS 253rd National Meeting, San Francisco, CA, 2017 (oral presentation).
45. Zhenmeng Peng*, Platinum Alloy Nanocatalyst with Manipulated Particle Composition and Morphology for Improved ORR Properties, Anhui University, Hefei, China, 01/03/2017 (invited talk).
46. Zhenmeng Peng*, Platinum Alloy Nanocatalyst with Manipulated Particle Composition and Morphology for Improved ORR Properties, GM Technical Center, Warren, MI, 12/15/2016 (invited talk).
47. Changlin Zhang, Sang Youp Hwang, Shirin Norooz Oliaee, Zhenmeng Peng*, Scalable Production of Facet-Controlled Platinum Group Metal Nanoparticles at Gas-Solid Interface and the Application for Catalysis, MRS Fall Meeting, Boston, MA, 2016 (oral presentation).
48. Sang Youp Hwang, Eric Yurchekfrodl, Zhenmeng Peng*, Carbon Monoxide Oxidation and Preferential Oxidation on Pt Alloy Nanoparticle Catalyst with Engineered Surface, AIChE annual meeting, San Francisco, CA, 2016 (oral presentation).
49. Zhenmeng Peng*, Platinum Alloy Nanocatalyst with Manipulated Particle Composition and Morphology for Improved ORR Properties, University of New Hampshire, Durham, NH, June 15th, 2016 (invited seminar).
50. Sang Youp Hwang, Eric Yurchekfrodl, Changlin Zhang, Zhenmeng Peng*, Low-Temperature Preferential Oxidation of Carbon Monoxide on Pt₃Ni Alloy Nanoparticle Catalyst with Engineered Surface, Gordon Research Conference, New London, NH, 2016 (poster).
51. Changlin Zhang, Sang Youp Hwang, Zhenmeng Peng*, Platinum Alloy Nanocatalyst with Manipulated Particle Composition and Morphology for Improved ORR Property, 229th ECS Meeting, San Diego, CA, 2016 (oral presentation).
52. Changlin Zhang, Sang Youp Hwang, Zhenmeng Peng*, Surfactant-Free and Scalable Manufacturing of Octahedral Platinum Alloy Nanoparticle Catalyst for Improved ORR Property, TechConnect World Innovation Conference, National Harbor, MD, 2016 (oral presentation).
53. Changlin Zhang, Sang Youp Hwang, Shirin Norooz Oliaee, Zhenmeng Peng*, Studying Growth Process of Facet-Controlled Platinum Group Metal Nanoparticles on Substrate with Electron Microscopy and IR Spectroscopy, MSNO May Conference, John Carroll University, 2016 (invited talk).
54. Sang Youp Hwang, Eric Yurchekfrodl, Changlin Zhang, Zhenmeng Peng*, Low-Temperature Preferential Oxidation of Carbon Monoxide on Pt₃Ni Alloy Nanoparticle Catalyst with Engineered Surface, AIChE Midwest Regional Conference, Chicago, IL, 2016 (oral presentation).
55. S. Y. Hwang, Z. M. Peng*, Size Effect of Platinum Nanoparticle Catalyst on Methane Oxidation Reaction, AIChE annual meeting, Salt Lake City, UT, 2015 (oral presentation).

56. C. L. Zhang, S. Y. Hwang, S. N. Oliaee, Z. M. Peng*, Solid-State Chemistry Production and Property of Platinum Group Metal Nanoparticle Catalysts with Tailored Particle Morphology, DOE-BES Catalysis Science PI Meeting, Annapolis, MD, 2015 (poster).
57. C. L. Zhang, S. Y. Hwang, Z. M. Peng*, Octahedral Pt₂CuNi Uniform Alloy Nanoparticle Catalyst with High Activity and Promising Stability for Oxygen Reduction Reaction, NAM24, Pittsburgh, PA, 2015 (oral presentation).
58. S. Y. Hwang, E. Yurchekfrod, and Z. M. Peng*, Effect of Hydrogen Addition on in Catalytic Methane Oxidation at Low Temperature, NAM24, Pittsburgh, PA, 2015 (poster).
59. C. L. Zhang, S. Y. Hwang, Z. M. Peng*, Scalable and Low-Cost Manufacturing of Platinum Group Metal and Alloy Nanoparticle Catalysts with Tailored Particle Morphology, NAM24, Pittsburgh, PA, 2015 (poster).
60. Z. M. Peng*, Pt Electrocatalyst with Improved ORR Property by Manipulating Particle Composition and Morphology, NASA Glenn Research Center, Cleveland, OH, 2014 (invited talk).
61. C. L. Zhang, S. Y. Hwang, Z. M. Peng*, Surfactant-Free Production and Electrocatalytic Property of Platinum Nanoparticles with Tailored Particle Morphology, ElectrochemOhio, Columbus, OH, 2014 (oral presentation).
62. C. L. Zhang, S. Y. Hwang, Z. M. Peng*, Solid State Chemistry Mass Production of Platinum Group Metal Catalysts with Tailored Particle Morphology, AIChE annual meeting, Atlanta, GA, 2014 (oral presentation).
63. Z. M. Peng*, C. L. Zhang, S. Y. Hwang, Scalable and low-cost manufacturing of platinum group metal and alloy nanoparticles with tailored morphology, TechConnect World Conference, National Harbor, MD, 2014 (poster presentation).
64. S. Y. Hwang, C. L. Zhang, Z. M. Peng*, Pt-Ag alloy nanoparticle catalyst for CO oxidation, Pittsburgh-Cleveland Catalysis Society Annual Meeting, Pittsburgh, PA, 2014 (poster presentation).
65. C. L. Zhang, S. Y. Hwang, A. Trout, Z. M. Peng*, Mass production of octahedral Pt-Ni alloy electrocatalyst for oxygen reduction reaction, Pittsburgh-Cleveland Catalysis Society Annual Meeting, Pittsburgh, PA, 2014 (oral presentation).
66. Z. M. Peng*, Preparation of platinum nanoparticles with tailored morphology as advanced catalyst, Department of Chemical and Biomolecular Engineering, Ohio University, Athens, OH, 03/17/2014 (invited seminar).
67. Z. M. Peng*, Mass production of octahedral Pt-Ni/C using innovative solid state chemistry for oxygen reduction reaction, General Motors Company, Pontiac, MI, 12/12/2013 (invited talk).
68. Z. M. Peng*, C. L. Zhang, S. Y. Hwang, Engineering large-scale production of cubic platinum/carbon catalysts and the shape effect in electrocatalytic oxidation of ammonia, 246th ACS National Meeting, Indianapolis, IN, 2013 (oral presentation).
69. Z. M. Peng*, C. L. Zhang, S. Y. Hwang, Engineering facile, surfactant-free, and large-scale production of supported cubic platinum nanocrystals, NSF Advanced Manufacturing Workshop, Arlington, VA, 2013 (oral presentation).
70. C. L. Zhang, Z. M. Peng*, Facile Preparation of Carbon-Supported Cubic Platinum and the Shape Effect in Electrocatalytic Oxidation of Ammonia, North American Catalysis Society Meeting (23rd NAM), 2013, Louisville, KY (oral presentation).
71. C. L. Zhang, S. Y. Hwang, Z. M. Peng*, Engineering Large-Scale Production of Cubic Platinum/Carbon Catalysts and the Shape Effect in Electrocatalytic Oxidation of Ammonia, Pittsburgh-Cleveland Catalysis Society Annual Meeting, 2013, Pittsburgh, PA (invited talk).
72. Z. M. Peng, J. Wu, A. T. Bell*, Uncovering the Deactivation Mechanism of Platinum Catalysts in Light Alkane Dehydrogenation, AIChE Annual Meeting, 2012, Pittsburgh, PA (oral presentation).
73. Z. M. Peng, A. T. Bell*, Effects of Composition and Size of Pt_xSn_{1-x}/Mg(Al)O on the Catalytic Dehydrogenation of Light Alkanes, MRS Spring Meeting, 2012, San Francisco, CA (Oral presentation).
74. Z. M. Peng, A. T. Bell*, Electron Microscopy Study of Coke Formation on Platinum Catalyst in Alkane Dehydrogenation, MRS Spring Meeting, 2011, San Francisco, CA (oral presentation).

75. Z. M. Peng, H. J. You, H. Yang*, Phase Behavior and Electrochemical Property of Platinum-Silver Bimetallic Nanostructures, MRS Fall Meeting, 2009, Boston, MA (poster presentation, Finalist for Best Poster Award).
76. Z. M. Peng, J. B. Wu, H. Yang*, Preparation and Property of Platinum-on-Metal Heterogeneous Electrocatalysts, MRS Fall Meeting, 2009, Boston, MA (oral presentation).
77. Z. M. Peng, H. Yang*, Platinum-based Heteronanostructures and their Applications as Fuel Cell Electrocatalysts, Renewable Energy Symposium at the University of Rochester, Rochester, NY, 2009 (poster presentation).
78. H. Yang*, Z. M. Peng, J. B. Wu, I. Chaudhury, H. J. You, Crystal Phase Behaviour and Electrocatalytic Property of Nanostructured Platinum Alloys, MRS Spring Meeting, 2009, San Francisco, CA.
79. Z. M. Peng, S. C. Yang, S. Maksimuk, H. Yang*, Alloyed and Intermetallic Platinum-Based Nanomaterials as Fuel Cell Catalysts, AIChE Annual Meeting, Philadelphia, PA, 2008 (oral presentation).
80. Z. M. Peng, H. Yang*, PtAu Bimetallic Heteronanostructures from Pt-on-Au Nanoparticles: Conversion and their Applications for Electrocatalytic Oxidation of Formic Acid, AIChE Annual Meeting, Philadelphia, PA, 2008 (oral presentation).
81. Z. M. Peng, S. C. Yang, S. Maksimuk, H. Yang*, Alloyed, Intermetallic and Bimetallic Platinum-Based Nanomaterials as Fuel Cell Catalysts, the Rochester Fuel Cell Symposium, Rochester, NY, 2008 (poster presentation).
82. Z. M. Peng, H. Yang*, Growth and Electrochemical Properties of Platinum Heteronanostructures, the 82th ACS Colloidal & Surface Science Symposium, Raleigh, NC, 2008 (oral presentation).
83. E. Formo, E. Lee, Z. M. Peng, M. Yavuz, X. M. Lu, H. Yang, Y. N. Xia*, The Functionalization of Electrospun Ceramic Nanofibers with Varying Noble Metals and Nanostructures for Green Catalysis, MRS Fall Meeting, 2008, Boston, MA.
84. S. C. Yang, Z. M. Peng, S. Maksimuk, H. Yang*, Shape Control and Electrochemical Property of Pt and PtPb Nanostructures, MRS Spring Meeting, 2008, San Francisco, CA.

MAJOR AWARDS AND HONORS

- *Outstanding Researcher Award*, The University of Akron, 2021
- *FRC Faculty Research Fellowship*, The University of Akron, 2019
- *Firestone Research Fellowship*, The University of Akron, 2017
- *FRC Faculty Research Fellowship*, The University of Akron, 2016
- *FRC Faculty Research Fellowship*, The University of Akron, 2014
- *Firestone Research Fellowship*, The University of Akron, 2013
- *Chinese Government Award for Outstanding Self-Financed Students Abroad*, 2009
- *Best Poster Award (finalist)*, MRS Fall Meeting, Boston, MA, 2009
- *Leon Huntington Hooker Fellowship*, University of Rochester, 2009
- *Presidential Award*, Chinese Academy of Science, 2005

PH.D. STUDENT ADVISING

<i>Student</i>	<i>Title of Thesis</i>	<i>Completion Date</i>
Bosen Qin	Redox-mediated Electrodialysis for water treatment	05/2029 Expected
Srish Sridhar	Nonthermal plasma catalysis and reaction engineering	05/2030 Expected
Preethi Arunachalam	Redox-mediated Electrodialysis for critical materials recovery	05/2029 Expected
Yanlin Zhu	LOHC Electrocatalysis	05/2028 Expected

Parsa Pishva	<i>Dissertation: Nonthermal Plasma-Assisted Conversion of Biomass and Plastics into Value-Added Chemicals</i>	05/2026 (Next stop: Lam Research, CA)
Jinyao Tang	<i>Dissertation: Electrochemically Active Liquid Organic Hydrogen Carriers for Energy Generation and Storage</i>	08/2025 (Next stop: Shanghai, China)
Rongxuan Xie	<i>Dissertation: Design and Application of Redox-Mediated Flow Electrode Electrodialysis for Ion Removal and Recovery</i>	12/2024 (Next stop: Shanghai Research Institute of Chemical Industry, China)
Khaled Alsaikhan	<i>Dissertation: Enhancing Flow Electrode Deionization Cell Performance for Water Desalination</i>	05/2024 (Next stop: Professor at King Khalid University, Saudi)
Abdulrahman Alkhalidi	<i>Dissertation: Efficient Removal and Recovery of Phosphate and Ammonium from Wastewater by Redox Flow Deionization Cell</i>	12/2023 (Next stop: Professor at Jubail Industrial College, Saudi)
Abdullah Alsultan	<i>Dissertation: Optimizing and Redesigning of Flow Electrode Deionization Cell for High Desalination Performance</i>	08/2023 (Next stop: Professor at Jubail Industrial College, Saudi)
Jialu Li	<i>Dissertation: Exploring Catalysts and Sustainable Processes for Efficient Energy Conversion and Storage</i>	05/2023 (Next stop: Postdoc at LBL)
Dezhen Wu	<i>Dissertation: Materials, Catalysis, and System Design for Hydrogen Storage and Application</i>	05/2022 (Next stop: Postdoc at ANL)
Libo Yao	<i>Dissertation: Sustainable, Energy-Efficient Hydrogenation Processes for Selective Chemical Syntheses</i>	08/2021 (Next stop: Postdoc at University of Michigan)
Abdulaziz Bentalib	<i>Dissertation: Energy efficient water desalination based on Faradaic Reactions</i>	12/2020 (Next stop: Professor at King Saud University)
Yanbo Pan	<i>Dissertation: Energy efficiency-based rational design of catalytic and non-catalytic processes</i>	08/2020 (Next stop: Scientist at Brewer Science)
Xiaochen Shen	<i>Dissertation: Exploiting electrocatalyst for energy conversion: from structure to property</i>	08/2019 (Next stop: Postdoc at CWRU)
Changlin Zhang	<i>Dissertation: Rational design of electrocatalysts with enhanced catalytic performance in energy conversion</i>	12/2016 (Next stop: Postdoc at LBNL)
Sang Youp Hwang	<i>Dissertation: Synthesis of Pt based nanocatalysts with controlled particle parameters and study for their properties in oxidation reactions</i>	12/2016 (Next stop: Professor at Institute for Advanced

Shirin Norooz Oliaee (Female)	<i>Dissertation: Catalyst development and the structure-dependent properties for hydrazine decomposition</i>	Engineering, Korea) 08/2016 (Next stop: Research scientist at Aisin)
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M.S. STUDENT ADVISING

<i>Student</i>	<i>Title of Thesis</i>	<i>Completion Date</i>
Shane Sturm	Wastewater Treatment using FCDI	05/2022
Rhett Meyer	Saline Water Desalinization by Electrodialysis	08/2021
Abdulrahman Alkhalidi	Study of Ag/AgCl redox couple-based electrochemical desalination cell	12/2020
Abdullah Alsultan	Study of Ag/AgCl redox couple-based electrochemical desalination cell	12/2020
Bryan Theriot	Ferric & ferrous DTPA and chloride redox as flowable electrodes in capacitive deionization process for water desalination	12/2020
Khaled Alsaikhan	Study of Ag-Hg Alloy Nanomaterials for Electrochemical desalination	05/2020
Sammy Juma	Techno-Economic study of CO ₂ hydrogenation to methanol and dimethyl ether	05/2019
Dana Woychik	Electrochemical study of the catalysis of the oxygen evolution reaction on the surface of disordered mesoporous carbon-loaded Fe-Ni sites	12/2016
Abdulaziz Bentalib	Palladium silver alloy synthesis and characterizations	05/2016

UNDERGRADUATE STUDENT ADVISING

<i>Student</i>	<i>Title of Project</i>	<i>Duration</i>
Pheonix Sauter	Redox-mediated electrodialysis for water treatment	10/2025-present
Grayson Fountain	Redox-mediated electrodialysis for water treatment	10/2025-05/2026
Kinalya Hughes	Redox-mediated electrodialysis for water treatment	10/2025-05/2026
Sofia Romero	Catalyst Research for Nonthermal Plasma-Assisted Polyethylene Hydrogenolysis (NSF REU)	06/2025-07/2025
Alex Flaum	Catalyst Research for Liquid Organic Hydrogen Carrier Electrochemistry (CeRCaS Summer Research)	04/2024-07/2024
Kamariya Burke	Catalyst Research for Liquid Organic Hydrogen Carrier Electrochemistry (CeRCaS Summer Research)	04/2024-07/2024
Laura Newsom	Synthesis of PtCu catalysts for Electrochemical Ethylamine/Acetonitrile Half-Cell Reaction (NSF REU)	06/2023-07/2023
Steven Raczka	Amine Oxidation Electrocatalysis	09/2021 – 05/2022
Noah Henry	Scale-Up of Electrochemical Technique for Hard Water Softening (Honors project)	09/2021 – 05/2022
Michael Micci	Oxygen Evolution Reaction Catalyst Research (Honors project)	01/2020 – 05/2021
Michael Holly	CO oxidation on reducible metal oxides	05/2018 – 05/2019

Matthew George	Engineering mass transfer in flow battery (Honors project)	09/2017 – 05/2018
Stephen Sharkey	Flow battery efficiency optimization (Honors project)	09/2017 – 05/2018
Stephen Sharkey	Photocatalyst for HI decomposition	09/2016 – 05/2017
William Sandorf	Platinum-rhodium alloy electrocatalyst activities in methanol oxidation reaction (Honors project)	09/2015 - 05/2017
Benjamin Alexander Kitson	Selective catalytic decomposition of hydrazine (Honors project)	01/2016 - 05/2016
Eric Yurchekfrod	CO preferential oxidation catalyst development	09/2014 – 05/2017
Matthew George	CO preferential oxidation catalyst development	10/2013 – 05/2014
Alexis Trout (female)	Electrocatalyst development for oxygen reduction reaction (Honors project)	10/2013 – 05/2014

POSTDOCTORAL SCHOLAR MENTORING

<i>Postdoc</i>	<i>Title of Project</i>	<i>Duration</i>
Xiaochen Shen	Redox Electrodialysis Applications	04/2023 – 03/2025
Feipeng Yang	Mechanistic study of Fe-Ni-P catalysts in OER	03/2019 – 09/2019 (Next stop: Postdoc at LBNL)

VISITING SCHOLAR HOSTING

<i>Scholar</i>	<i>Position, Affiliation</i>	<i>Duration</i>
Yang Li	Associate Professor, Anhui University of Science and Technology	09/2019 – 08/2020
Wanchun Zhu	Associate Professor, Jilin University	09/2018 – 03/2019
Li Zhang (female)	Associate Professor, Zhengzhou University	08/2017 – 07/2018
Fei Hu (female)	Professor, Tongji University	12/2016 – 12/2017
Jiafu Chen	Associate Professor, Zhengzhou University	09/2015 – 09/2016
Xiangkai Kong	Associate Professor, Huaibei Normal University	03/2015 – 11/2015
Lixia Sun (female)	Associate Professor, China Jiliang University	06/2014 – 09/2014
Li Jiang (female)	Associate Professor, China Jiliang University	06/2014 – 09/2014
Chunju Lv (female)	Associate Professor, China Jiliang University	06/2014 – 09/2014

AWARDS RECEIVED BY STUDENTS

- Parsa Pishva, Chemical Engineering Graduate Research Award, University of South Carolina, 2026.
- Jialu Li, ChBE Graduate Research Award, The University of Akron, 2022
- Jialu Li, Kokes Award, North American Catalysis Society, 2022
- Dezhen Wu, ChBE Graduate Research Award, The University of Akron, 2021
- Jialu Li, ChBE Graduate Research Award (runner up), The University of Akron, 2021
- Libo Yao, ChBE Student Presentation Award (1st Place), The University of Akron, 2020
- Dezhen Wu, ChBE Student Presentation Award (3rd Place), The University of Akron, 2020
- Yanbo Pan, COE ChemStress Award, The University of Akron, 2019
- Dezhen Wu, ChBE Graduate Research Award, The University of Akron, 2019
- Yanbo Pan, ChBE Graduate Research Award, The University of Akron, 2018

- Xiaochen Shen, ChBE Graduate Research Award, The University of Akron, 2018
- Yanbo Pan, ChBE TA Award, The University of Akron, 2017
- Xiaochen Shen, ChBE Graduate Research Award, The University of Akron, 2016
- Xiaochen Shen, ChBE TA Award, The University of Akron, 2016
- Yanbo Pan, ChBE TA Award, The University of Akron, 2016
- Changlin Zhang, Kokes Award, North American Catalysis Society, 2015
- Changlin Zhang, COE ChemStress Award, The University of Akron, 2015
- Changlin Zhang, ChBE Graduate Research Award, The University of Akron, 2014
- Changlin Zhang, ChBE Graduate Research Award, The University of Akron, 2013

DEPARTMENTAL, COLLEGE AND UNIVERSITY COMMITTEES, SERVICES, ETC.

<i>Activities</i>	<i>Function</i>	<i>Duration</i>
ECHE Battery Faculty Search Committee, USC	Member	2025
MCEC Research Committee, USC	Member	2025 - present
ECHE Undergraduate Program Committee, USC	Member	2025 - present
ECHE Battery Faculty Search Committee, USC	Member	2024
ECHE Graduate Admission Committee, USC	Member	08/2023 - present
CBCE Graduate Admission Committee, UA	Chair	08/2021 – 12/2022
Nation Ford ChemE Spend-A-Day Field Trip	Faculty representative	04/13/2024
SC Region II Science and Engineering Fair	Judge	03/08/2024
CBCE Departmental Chair Search Committee, UA	Member	Spring 2021
CBCE Departmental Seminars, UA	Coordinator	01/2014 – 05/2021
Program Assessment Committee, UA	Member	01/2021 – 05/2021
Online Course Development Committee, UA	Member	Fall 2016
Faculty Research Committee, UA	Member	09/2017 – 12/2022
Ohio Super Computer Committee, UA	Member	09/2017 – 12/2022
Graduate Assessment Committee, ChBE, UA	Member	09/2015 – 05/2016
ChBE Faculty Search Committee, UA	Member	01/2013 – 05/2016
Hudson Middle School Science Olympiad	Mentor	08/2021 – 04/2022
State Science Day	Judge	05/2020, 05/2021
Western Reserve District 5 Science Day	Judge	05/2020
STEM Career Day, UA	Judge	06/2017, 06/2019
Women in Engineering Summer Camp, COE	Advisor	06/2016
HS Summer Research Program, COE	Advisor	07/2016 – 08/2016
HS Solar Race, COE	Judge	04/2015
SEE U!, COE	Judge	06/2014

PROFESSIONAL ACTIVITIES

Administrative Service

- *President*, Pittsburgh-Cleveland Catalysis Society (PCCS), 2016-2018
- *President-Elect*, Pittsburgh-Cleveland Catalysis Society (PCCS), 2014-2016
- *Review Editor*, Frontiers in Chemistry, 2017 – present
- *Guest Editor*, Catalysts, 2018
- *Editor*, Frontiers in Materials, 2020 - present
- *Editor*, Processes, 2021 – present
- *Editorial Board*, Scientific Reports, 2023 - present

Organizer/Chair for Conferences/Symposiums

- *Session Chair*, AIChE Annual Meeting, 11/2025
- *Session Chair*, MRS Spring Meeting, 04/2020
- *Session Chair*, NAM 26 meeting, 06/2019
- *Organizer/Chair/Co-chair*, PCCS annual meeting, 09/2016, 05/2017
- *Session Chair/Co-chair*, AIChE Annual Meeting – Electrocatalysis and Photoelectrocatalysis Symposium, 11/2015, 11/2016, 10/2017
- *Session Chair/Co-chair*, AIChE Annual Meeting – Rational Catalyst Design Symposium, 11/2016, 10/2017
- *Session Chair*, ACS-SAS-MSNO Meeting, 05/2015

Reviewer for Funding Agencies

- National Science Foundation (NSF)
- Department of Energy (DOE)
- American Chemical Society – Petroleum Research Foundation (ACS PRF)

Reviewer for Journals

- ACS Applied Materials & Interfaces
- ACS Applied Energy Materials
- ACS Catalysis
- ACS Energy Letters
- ACS Nano
- Advanced Energy Materials
- Advanced Functional Materials
- Advanced Materials
- Angewandte Chemie International Edition
- Applied Catalysis B
- Catalysis Science and Technology
- Chemical Communications
- Frontiers in Energy
- Journal of Alloys and Compounds
- Journal of the American Chemical Society
- Journal of Applied Catalysis B: Environmental
- Journal of Catalysis
- Journal of Colloid and Interface Science
- Journal of Materials Chemistry
- Journal of Nanomaterials
- Journal of Nanoscience and Nanotechnology
- Journal of Physical Chemistry
- Materials Science and Engineering B
- Nano Energy

- Nano Letters
- Nature Catalysis
- Nature Communications
- Nature Energy
- Nature Nanotechnology
- RSC Advances
- Etc.

Membership

- American Institute of Chemical Engineers
- North American Catalysis Society
- American Chemical Society
- The Electrochemical Society
- Materials Research Society