Qiming Liu

Department of Chemistry and Biochemistry, University of California

1156 High Street, Santa Cruz, CA 95064

Tel.: (831) 346-9825; E-mail: qliu40@ucsc.edu

EDUCATION

09/2018 – present	Ph.D. in Chemistry (expected Spring 2023), University of California, Santa Cruz (UCSC) Advisor: Prof. Shaowei Chen
09/2014 – 06/2018	B.E. in Material Chemistry, Central South University (CSU), Changsha, China

RESEARCH INTERESTS

- Ultrafast synthesis of electrocatalysis of oxygen reduction reaction, hydrogen evolution reaction, oxygen evolution reaction
- Ligands-functionalized nanoparticles and metal-ligands charge transfer
- Density functional theory calculations of electrocatalysis and interfacial charge transfer

PROFESSIONAL EXPERIENCE

2018 – present	Graduate Student Research/Teaching Assistant, UCSC
2019 – present	Research mentor of three undergraduate students, UCSC
2021 – present	Collaborating User, Lawrence Berkeley National Lab (LBNL)
November 2021	Collaborating User, Stanford Synchrotron Radiation Lightsource (SSRL)
Summer 2021	Teacher fellow, California State Summer School for Mathematics and Science (COSMOS)
Summer 2019	Research mentor, UCSC Science Internship Program (SIP)
Summer 2019	Teaching assistant, COSMOS
2016 – 2018	Undergraduate Research Assistant, CSU

AWARDS AND HONORS

- International Precious Metals Institute (IPMI) Student Award, 2022
- Sigma XI, Grants in Aid of Research, 2021
- Honorable Mention, IPMI Student Award, 2021
- Regents Fellowship, UCSC, 2018
- Graduation with Honors (Bachelor), CSU, 2018
- Outstanding Students (Three times), CSU, 2015 – 2018
- Honorable Mention, Interdisciplinary Contest in Modeling, United States, 2017
- NBTM New Materials Ltd. Scholarship, CSU, 2017
- GKN Ltd. Scholarship, CSU, 2016
- Peiyun Huang Scholarship, CSU, 2015
- National Silver Prize, The “Internet+” Innovation Competition, China, 2015

PATENTS

Shaowei Chen, Bingzhang Lu, **Qiming Liu**, "Rapid Preparation of Non-Equilibrium Fe-Ni Spinels by Magnetic Induction Heating for High-Performance Oxygen Evolution Electrocatalysis", UC Case No. 2022-820-1, submitted and in review.

PUBLICATIONS (# denotes equal contributor)

1. **Qiming Liu**, Forrest Nichols, Amrinder Bhuller, Gabriel Flannery, Frank Bridges, Shaowei Chen, "Rapid Preparation of Amorphous $MoS_{2-x}Cl_x$ towards Hydrogen Evolution Reaction by Magnetic Induction Heating", manuscript in preparation
2. **Qiming Liu**, Forrest Nichols, Bingzhang Lu, Dingjie Pan, Frank Bridges, Shaowei Chen, "Ultrafast Carbonization of ZIF 67 by Magnetic Induction Heating towards Oxygen Evolution Reaction", manuscript in preparation.
3. **Qiming Liu**, Bingzhang Lu, Forrest Nichols, Rene Mercado, Frank Bridges, Shaowei Chen, "Rapid Preparation of Ruthenium Catalysts by Magnetic Induction Heating towards Efficient Hydrogen Evolution Reaction in Both Acidic and Alkaline Media", under review.
4. Bingzhang Lu#, **Qiming Liu**#, Chunyang Wang, Zaheer Masood, David Morris, Forrest Nichols, Rene Mercado, Qingfeng Ge, Peng Zhang, Huolin Xin, Shaowei Chen, "Rapid Preparation of Non-Equilibrium Fe-Ni Spinels by Magnetic Induction Heating for High-Performance Oxygen Evolution Electrocatalysis", under review.
5. **Qiming Liu**#, Yi Peng#, Zaheer Masood, Forrest Nichols, Rene Mercado, Tufa Assafa, Frank Bridges, Glenn Millhauser, Qingfeng Ge, Shaowei Chen, "Stable Cuprous Hydroxide Nanoparticles by Organic Ligand Functionalization", under review.
6. **Qiming Liu**, Hongbo Zhou, Forrest Nichols, Rene Mercado, Bingzhang Lu, Weiya Zhu, Shaowei Chen, "Oxygen Reduction Reaction Catalyzed by Carbon Composites with Ruthenium-Doped Iron Oxide Nanoparticles", under review.
7. Yi Peng#, **Qiming Liu**#, Bingzhang Lu#, Ting He, Forrest Nichols, Xiao Hu, Tiffanie Huang, Grace Huang, Lizette Guzman, Yuan Ping, Shaowei Chen, "Organically Capped Iridium Nanoparticles as High-Performance Bifunctional Electrocatalysts for Full Water Splitting in Both Acidic and Alkaline Media: Impacts of Metal-Ligand Interfacial Interactions", *ACS Catal*., **2021**, *11*, 1179. DOI: 10.1021/acscatal.0c03747
8. Bingzhang Lu#, **Qiming Liu**#, Shaowei Chen, "Electrocatalysis of Single Atom Sites: Impacts of Atomic Coordination", *ACS Catal.,* **2020**, *10*, 14, 7584. DOI: 10.1021/acscatal.0c01950
9. **Qiming Liu**, Yi Peng, Qiaoxia Li, Ting He, David Morris, Forrest Nichols, Rene Mercado, Peng Zhang, Shaowei Chen, "Atomic Dispersion and Surface Enrichment of Palladium in Nitrogen-Doped Porous Carbon Cages Leads to High-Performance Electrocatalytic Reduction of Oxygen", *ACS Appl. Mater. Interfaces*, **2020**, *12*, 17641. DOI: 10.1021/acsami.0c03415
10. **Qiming Liu**, Qiaoxia Li, Shaowei Chen, "Metal-Nitrogen Coordination Moieties in Carbon for Effective Electrocatalytic Reduction of Oxygen", *Curr. Opin. Electrochem.,* **2020**, *21*, 46. DOI: 10.1016/j.coelec.2020.01.002
11. Yi Peng#, **Qiming Liu**#, Shaowei Chen, "Structural Engineering of Semiconductor Nanoparticles by Conjugated Interfacial Bonds", *The Chem. Rec*., **2020**, *20*, 41. DOI:

10.1002/tcr.201900010

12. Ting He, Yaya Song, Yang Chen, Xianwen Song, Bingzhang Lu, **Qiming Liu**, Hongtao Liu, Yi Zhang, Xiaoping Ouyang, Shaowei Chen, "Atomically dispersed ruthenium in carbon aerogels as effective catalysts for pH-universal hydrogen evolution reaction", under review
13. Ting He, Yang Chen, **Qiming Liu**, Bingzhang Lu, Hongtao Liu, Yi Zang, Xiaoping Ouyang, Shaowei Chen, "Theory-Guided Regulation of FeN4 Spin State by Neighboring Cu Atoms for Enhanced Oxygen Reduction Electrocatalysis in Flexible Metal-Air Batteries", under review
14. Yaya Song, Ting He, Yulin Zhang, Chunyang Yin, Yang Chen, **Qiming Liu**, Yi Zhang, Shaowei Chen, "Cobalt Single Atom Sites in Carbon Aerogels for Ultrasensitive Enzyme-Free Electrochemical Detection of Glucose", *J. Electroanal. Chem.*, **2022**, accepted.
15. Meng Li, Zilong Li, Xiaolong Yu, Yinlong Wu, Cehui Mo, Mi Luo, Ligui Li, Shaoqi Zhou, **Qiming Liu**, Nan Wang, King Lun Yeung, Shaowei Chen, "FeN4-Doped Carbon Nanotubes Derived from Metal Organic Frameworks for Effective Degradation of Organic Dyes by Peroxymonosulfate: Impacts of FeN4 Spin States", *Chem. Eng. J.*, **2021**, 133339. DOI: 10.1016/j.cej.2021.133339
16. Likai Wang, Yinggang Sun, Shenzhi Zhang, Hexiang Di, **Qiming Liu**, Xin Du, Zhongfang Li, Kai Yang, Shaowei Chen, "Co/Co2P Nanoparticles Encapsulated within Hierarchically Porous N, P, S-codoped Carbon as Bifunctional Electrocatalysts for Rechargeable Zinc-Air Batteries", *ChemElectroChem*, **2021**, *8*, 4286-4295. DOI: doi.org/10.1002/celc.202101246
17. Nan Wang, Shunlian Ning, Xiaolong Yu, Di Chen, Zilong Li, Jinchang Xu, Hui Meng, Dengke Zhao, Ligui Li, **Qiming Liu**, Bingzhang Lu, and Shaowei Chen, "Graphene Composites with Ru-RuO2 Heterostructures: Highly Efficient Mott–Schottky-Type Electrocatalysts for pH-Universal Water Splitting and Flexible Zinc–Air Batteries", *Appl. Catal. B: Environ.*, **2021**, *302*, 120838. DOI: 10.1016/j.apcatb.2021.120838
18. Yunyun Wu, Haodong Ji, **Qiming Liu**, Zhaoyang Sun, Peisheng Li, Peiren Ding, Ming Guo, Xiaohong Yi, Wenlu Xu, Chong-Chen Wang, Shuai Gao, Qiang Wang, Wen Liu, Shaowei Chen, "Visible light photocatalytic degradation of sulfanilamide enhanced by Mo doping of BiOBr nanoflowers", *J. Hazard. Mater.*, **2021**, *424*, 127563. DOI: 10.1016/j.jhazmat.2021.127563
19. Forrest Nichols, **Qiming Liu**, Jasleen Sandhu, Zahra Azhar, Rafael Cazares, Rene Mercado, Frank Bridges, Shaowei Chen, "Platinum-complexed phosphorous-doped carbon nitride for electrocatalytic hydrogen evolution", *J. Mater. Chem. A*, **2021**, accepted. DOI: 10.1039/D1TA06240A
20. Xingzi Wu, Yujie Sun, Ting He, Yulin Zhang, Guo-Jun Zhang, **Qiming Liu**, Shaowei Chen, "Iron, Nitrogen-Doped Carbon Aerogels for Fluorescent and Electrochemical Dual-Mode Detection of Glucose", *Langmuir*, **2021**, *37*, 11309. DOI: 10.1021/acs.langmuir.1c01866
21. Jingjing Fang, **Qiming Liu**, Xiongwu Kang, Shaowei Chen, "Selective hydrogenation of 4-nitrostyrene to 4-nitroethylbenzene catalyzed by Pd@Ru core-shell nanocubes", *Rare Met.*, **2021**, accepted. DOI: 10.1007/s12598-021-01868-0
22. Peiren Ding, Haodong Ji, Peishen Li, **Qiming Liu**, Yunyun Wu, Ming Guo, Ziang Zhou, Shuai Gao, Wenlu Xu, Wen Liu, Qiang Wang, Shaowei Chen, "Visible-light degradation of antibiotics catalyzed by titania/zirconia/graphitic carbon nitride ternary nanocomposites: a

combined experimental and theoretical study", *Appl. Catal. B: Environ.*, **2021**, *300*, 120633. DOI: 10.1016/j.apcatb.2021.120633

23. Qiang Li, Ting He, Xingxing Jiang, Yulai Lei, **Qiming Liu**, Chuntai Liu, Zhifang Sun, Shaowei Chen, Yi Zhang, "Boosting oxygen evolution activity of nickel iron hydroxide by iron hydroxide colloidal particles", *J. Colloid Interface Sci.*, **2022**, *606*, 518. DOI: 10.1016/j.jcis.2021.08.037
24. Mengwei Yuan, Zemin Sun, Han Yang, Di Wang, **Qiming Liu**, Caiyun Nan, Huifeng Li, Genban Sun, and Shaowei Chen, "Self-Catalyzed Rechargeable Lithium-Air Battery by in-situ Metal Ion Doping of Discharge Products: A Combined Theoretical and Experimental Study", *Energy Environ. Mater.*, **2021**, accepted. DOI: 10.1002/eem2.12258
25. Peishen Li, Shuai Gao, **Qiming Liu**, Peiren Ding, Yunyun Wu, Changzheng Wang, Shaobin Yu, Wen Liu, Qiang Wang, Shaowei Chen, "Recent Progress of the Design and Engineering of Bismuth Oxyhalides for Photocatalytic Nitrogen Fixation", *Adv. Energy Sustain. Res.*, **2021**, 2000097. DOI: 10.1002/aesr.202000097
26. Bingzhang Lu, **Qiming Liu**, Forrest Nichols, Rene Mercado, David Morris, Ning Li, Peng Zhang, Peng Gao, Yuan Ping, Shaowei Chen, "Oxygen Reduction Reaction Catalyzed by Carbon-Supported Platinum Few-Atom Clusters: Significant Enhancement by Doping of Atomic Cobalt", *Research*, **2020**, 9167829. DOI: 10.34133/2020/9167829
27. Xun Zhao, **Qiming Liu**, Qiaoxia Li, Lingyun Chen, Lei Miao, Huayu Wang, Shaowei Chen, "Two-dimensional Electrocatalysts for Alcohol Oxidation: A Critical Review", *Chem. Eng. J.*, **2020**, *400*, 125744. DOI: 10.1016/j.cej.2020.125744
28. Yumeng Ma, Shasha Luo, Minghua Tian, Jia En Lu, Yi Peng, Cooper Desmond, **Qiming Liu**, Qiaoxia Li, Yulin Min, Qunjie Xu, Shaowei Chen, "Hollow Carbon Spheres Codoped with Nitrogen and Iron as Effective Electrocatalysts for Oxygen Reduction Reaction", *J. Power Sources*, **2020**, *450*, 227659. DOI: 10.1016/j.jpowsour.2019.227659
29. Ting He, Yi Peng, Qiaoxia Li, Jia En Lu, **Qiming Liu**, Rene Mercado, Yang Chen, Forrest Nichols, Yi Zhang, Shaowei Chen, "Nanocomposites Based on Ruthenium Nanoparticles Supported on Cobalt, Nitrogen-Codoped Graphene Nanosheets as Bifunctional Catalysts for Electrochemical Water Splitting", *ACS Appl. Mater. Interfaces*, **2019**, *11*, 46912. DOI: 10.1021/acsami.9b17056