

Xiaoqian Wang

PostDoctoral Fellow | KAUST, Saudi Arabia

✉ustcw@outlook.com ☎+86-18655171774

RESEARCH EXPERIENCE

PostDoctoral Fellow

May 2020 – present

King Abdullah University of Science and Technology
Advanced Membranes and Porous Materials Center

- Electrocatalytic conversion of CH_4 and O_2 into CO and H_2
- *In-situ* XRD observation of catalysts under CO_2 electro-reduction process

Doctor Candidate, Research Assistant

Sep. 2016 – Dec. 2020

University of Science and Technology of China
Center of Advanced Nanocatalysis

- Electro-reduction of CO_2 into valuable chemicals
- Water electrolysis and hydrogen fuel cells
- Selective oxidation of CH_4
- Electrocatalytic generation of ammonia
- Synthesis of nanostructured catalysts including MOFs, alloys, and single-atom materials
- *In-situ* XAS for catalysis

Undergraduate Research Assistant

Jan. 2014 – Aug. 2016

University of Science and Technology of China

- Synthesis of MoS_2 nanowires via CVD methods
- The applications of MoS_2 -based materials in field-effect transistors

TECHNICAL SKILLS

IT Skills

AutoCAD (basic), Origin (advanced), Photoshop, Lightroom, MS Office...

Catalysis

membrane electrode assembly, gas diffusion electrode, fuel cell, flow cell, electrochemical workstation (CV, i-t, EIS...), CO_2 & N_2 reduction, water electrolysis, Parr reactor, ORR, HER, OER...

Characterization

TEM, SEM, (*in-situ*) XAS (EXAFS, XANES), Raman, (AP)XPS, (*in-situ*) XRD, UV-vis, IR, TGA, AFM, BET...

Quantitative Analysis

ICP, NMR, GC, MS, HPLC, spectrophotometry...

EDUCATION

Dr. rer. nat. in Chemistry

University of Science and Technology of China (USTC)

2016–2020

Hefei, China

B.S. in Material Physics

University of Science and Technology of China (USTC)

Lu Jiaxi Talent Program; Graduate Thesis Grade: A+

2012–2016

Hefei, China

ACADEMIC SERVICES

Editorial board memberships

- Associate Editor, *Frontiers of Catalysis*
- Guest Editor, *Nanomaterials*
- Academic Editor, *Journal of Nanomaterials*
- Young Editorial Board Member, *Exploration*

2022–present

2022–present

2022–present

2022–2023

Professional society membership

- *International Society of Electrochemistry*
- *Chinese Chemical Society*

2022–present

2022–present

Reviewer for 10+ journals, 30+ submissions

Catalysis Communications, International Journal of Hydrogen Energy, Journal of CO_2 Utilization, Materials Today Chemistry, Nano-Micro Letters, Exploration, Catalysts, Nanomaterials, Energies, Molecules, Magnetochemistry

CONFERENCES

- X. Wang, *et al.*, “Atomically Dispersed Catalysts for Energy-Related Catalysis”, 10th International Conference on Materials for Advanced Technologies, Singapore, Jun. 23–28, 2019 (Oral presentation).
- X. Wang, *et al.*, “Atomically Dispersed Catalysts for Energy-Related Catalysis”, 3rd Edition of International Congress on Catalysis and Chemical Science, Singapore, Mar. 9–11, 2019 (Oral presentation).
- X. Wang, *et al.*, “Regulation of Coordination Number over Single Co Sites Triggers the Efficient Electroreduction of CO₂”, 4th International Conference of Advances in Functional Material, Nanjing, China, Aug. 27–30, 2018 (Oral presentation).

PUBLICATIONS

Citations: >5,600; H-index: 24

Google Scholar: [Xiaoqian Wang](#); ORCID: 00-0002-8675-9311; Researcher ID: S-4406-2016

Fuel Cells & ORR

- A supported palladium on gallium-based liquid metal catalyst for enhanced oxygen reduction reaction. C. Ma, B. Song, Z. Ma, X. Wang, L. Tian, H. Zhang, C. Chen, X. Zheng, L. Yang, Y. Wu. *Chemical Research in Chinese Universities*. 2022, 38, 1219.
- Negative pressure pyrolysis induced highly accessible single sites dispersed on 3D graphene frameworks for enhanced oxygen reduction. H. Zhou, T. Yang, Z. Kou, L. Shen, Y. Zhao, Z. Wang, X. Wang, Z. Yang, J. Du, J. Xu, M. Chen, L. Tian, W. Guo, Q. Wang, H. Lv, W. Chen, X. Hong, J. Luo, D. He, Y. Wu. *Angew. Chem. Int. Ed.* 2020, 59, 20465–20469.
- Review of metal catalysts for oxygen reduction reaction: from nano-scale engineering to atomic design. X. Wang, Z. Li, Y. Qu, T. Yuan, W. Wang, Y. Wu, Y. Li. *Chem*, 2019, 5, 1486–1511.
- Synergistic effect of well-defined dual sites boosting the oxygen reduction reaction. J. Wang, W. Liu, G. Luo, Z. Li, C. Zhao, H. Zhang, M. Zhu, Q. Xu, X. Wang, C. Zhao, Y. Qu, Z. Yang, T. Yao, Y. Li, Y. Lin, Y. Wu, Y. Li. *Energ. Environ. Sci.* 2018, 11, 3375–3379.
- Research and development of single site catalyst in electrocatalytic reduction of CO₂. X. Zhao, X. Wang, Y. Wu. *Sci. China-Chem.* 2018, 48, 1027–1039.

Water Electrolysis, HER & OER

- NiCo-LDH nanosheets strongly coupled with GO-CNTs as a hybrid electrocatalyst for oxygen evolution reaction. P. Yin, G. Wu, X. Wang, S. Liu, F. Zhou, L. Dai, X. Wang, B. Yang, Z. Yu. *Nano Res.* 2021, 14, 4783–4788.
- Engineering electronic structure of sub-monolayer Pt on intermetallic Pd₃Pb via charge transfer boosts hydrogen evolution reaction. Y. Yao, X. Gu, D. He, Z. Li, W. Liu, Q. Xu, T. Yao, Y. Lin, H. Wang, C. Zhao, X. Wang, P. Yin, H. Li, X. Hong, S. Wei, W. Li, Y. Li, Y. Wu. *J. Am. Chem. Soc.* 2019, 141, 19964–19968.
- Engineering the electronic structure of single atom Ru sites via compressive strain boosts acidic water oxidation electrocatalysis. Y. Yao, S. Hu, W. Chen, Z.-Q. Huang, W. Wei, T. Yao, R. Liu, K. Zang, X. Wang, G. Wu, W. Yuan, T. Yuan, B. Zhu, W. Liu, Z. Li, D. He, Z. Xue, Y. Wang, X. Zheng, J. Dong, C.-R. Chang, Y. Chen, X. Hong, J. Luo, S. Wei, W.-X. Li, P. Strasser, Y. Wu, Y. Li. *Nat. Catal.* 2019, 2, 304–313 (Front Cover).
- Atomically dispersed copper–platinum dual sites alloyed with palladium nanorings catalyze the hydrogen evolution reaction. T. Chao, X. Luo, W. Chen, B. Jiang, J. Ge, Y. Lin, G. Wu, X. Wang, Y. Hu, Z. Zhuang, Y. Wu, X. Hong, Y. Li. *Angew. Chem. Int. Ed.* 2017, 56, 16047–16051.
- Hierarchical Fe-doped NiO_x nanotubes assembled from ultrathin nanosheets containing trivalent nickel for oxygen evolution reaction. G. Wu, W. Chen, X. Zheng, D. He, Y. Luo, X. Wang, J. Yang, Y. Wu, W. Yan, Z. Zhuang, X. Hong, Y. Li. *Nano Energy* 2017, 38, 167–174.

CO₂ Electro-reduction

- Structural evolution and strain generation of derived-Cu catalysts during CO₂ electroreduction. Q. Lei, L. Huang, J. Yin, B. Davaasuren, Y. Yuan, X. Dong, Z. Wu, X. Wang, K. Yao, X. Lu, Y. Han, *Nat. Commun.* 2022, 13, 4857.
- Solid-diffusion synthesis of single-atom catalysts directly from bulk metal for efficient CO₂ reduction. C. Zhao, Y. Wang, Z. Li, W. Chen, Q. Xu, D. He, D. Xi, Q. Zhang, T. Yuan, Y. Qu, J. Yang, F. Zhou, Z. Yang, X. Wang, J. Wang, J. Luo, Y. Li, H. Duan, Y. Wu, Y. Li. *Joule* 2019, 3, 584–594.
- Regulation of coordination number over single Co sites: triggering the efficient electroreduction of CO₂. X. Wang, Z. Chen, X. Zhao, T. Yao, W. Chen, R. You, C. Zhao, G. Wu, J. Wang, W. Huang, J. Yang, X. Hong, S. Wei, Y. Wu, Y. Li. *Angew. Chem. Int. Ed.* 2018, 57, 1944–1948.
- Ionic exchange of metal-organic frameworks to access single nickel sites for efficient electroreduction of CO₂. C. Zhao, X. Dai, T. Yao, W. Chen, X. Wang, J. Wang, J. Yang, S. Wei, Y. Wu, Y. Li. *J. Am. Chem. Soc.* 2017, 139, 8078–8081.
- Ultrathin layers: realizing efficient CO₂ electroreduction. X. Wang, Y. Wu, Y. Li. *Prog. Chem.* 2017, 29, 1–2.

N₂ Electro-reduction

- *Highly productive electrosynthesis of ammonia by ad molecule-targeting single Ag sites.* Y. Chen[†], R. Guo[†], X. Peng[†], X. Wang[†], X. Liu, J. Ren, J. He, L. Zhuo, J. Sun, Y. Liu, Y. Wu, J. Luo. *ACS Nano*. 2020, 14, 6938–6946.
- *Atomically dispersed Au₁ catalyst towards efficient electrochemical synthesis of ammonia.* X. Wang, W. Wang, M. Qiao, G. Wu, W. Chen, T. Yuan, Q. Xu, M. Chen, Y. Zhang, X. Wang, J. Wang, J. Ge, X. Hong, Y. Li, Y. Wu, Y. Li. *Sci. Bull.* 2018, 63, 1246–1253 (Front Cover).

Nanomaterials Synthesis

- *General design concept for single-atom catalysts toward heterogeneous catalysis.* W. Guo[†], Z. Wang[†], X. Wang[†], Y. Wu. *Adv. Mater.* 2021, 33, 2004287.
- *Ultrathin amorphous/crystalline heterophase Rh and Rh alloy nanosheets as tandem catalysts for direct indole synthesis.* J. Ge, P. Yin, Y. Chen, H. Cheng, J. Liu, B. Chen, C. Tan, P. Yin, H. Zheng, Q. Li, S. Chen, W. Xu, X. Wang, G. Wu, R. Sun, X. Shan, X. Hong, H. Zhang. *Adv. Mater.* 2021, 33, 2006711.
- *Photopolymerization performed under dark conditions using long-stored electrons in carbon nitride.* G. Chen, Z. Zhang, W. Zhang, L. Xia, X. Nie, W. Huang, X. Wang, L. Wang, C. Hong, Z. Zhang, Y. You. *Mater. Horiz.* 2021, 8, 2018–2024.
- *Cation-exchange induced precise regulation of single copper site triggers room-temperature oxidation of benzene.* H. Zhou, Y. Zhao, J. Gan, J. Xu, Y. Wang, H. Lv, S. Fang, Z. Wang, Z. Deng, X. Wang, P. Liu, W. Guo, B. Mao, H. Wang, T. Yao, X. Hong, S. Wei, X. Duan, J. Luo, Y. Wu. *J. Am. Chem. Soc.* 2020, 142, 29, 12643–12650.
- *Recover the activity of sintered supported catalysts by nitrogen-doped carbon atomization.* H. Zhou, Y. Zhao, J. Xu, H. Sun, Z. Li, W. Liu, T. Yuan, X. Wang, W.-C. Cheong, Z. Wang, X. Wang, C. Zhao, Y. Yao, W. Wang, F. Zhou, M. Chen, B. Jin, R. Sun, J. Liu, X. Hong, T. Yao, S. Wei, J. Luo, Y. Wu. *Nat. Commun.* 2020, 11, 335.
- *A supported nickel catalyst stabilized by a surface digging effect for efficient methane oxidation.* H. Zhou, T. Liu, X. Zhao, Y. Zhao, H. Lv, S. Fang, X. Wang, F. Zhou, Q. Xu, J. Xu, C. Xiong, Z. Xue, K. Wang, W. Cheong, W. Xi, L. Gu, T. Yao, S. Wei, X. Hong, J. Luo, Y. Li, Y. Wu. *Angew. Chem. Int. Ed.* 2019, 131, 18559–18564.
- *A general synthesis approach for amorphous noble metal nanosheets.* G. Wu, X. Zheng, P. Cui, H. Jiang, X. Wang, Y. Qu, W. Chen, Y. Lin, H. Li, X. Han, Y. Hu, P. Liu, Q. Zhang, J. Ge, Y. Yao, Y. Wu, L. Gu, X. Hong, Y. Li. *Nat. Commun.* 2019, 10, 4855.
- *Highly sensitive ethanol gas sensor based on ultrathin nanosheets assembled Bi₂WO₆ with composite phase.* T. Yuan, Z. Li, W. Zhang, Z. Xue, X. Wang, Z. Ma, Y. Fan, J. Xu, Y. Wu. *Sci. Bull.* 2019, 64 595–602.
- *2D MOF induced accessible and exclusive co single sites for efficient O-silylation of alcohols with silanes.* X. Wang, P. Li, Z. Li, W. Chen, H. Zhou, Y. Zhao, X. Wang, L. Zheng, J. Dong, Y. Lin, X. Zheng, W. Yan, J. Yang, Z. Yang, Y. Qu, T. Yuan, Y. Wu, Y. Li. *Chem. Commun.* 2019, 55, 6563–6566.
- *Unraveling the enzyme-like activity of heterogeneous single atom catalyst.* C. Zhao, C. Xiong, X. Liu, M. Qiao, Z. Li, T. Yuan, J. Wang, Y. Qu, X. Wang, F. Zhou, Q. Xu, S. Wang, M. Chen, W. Wang, Y. Li, T. Yao, Y. Wu, Y. Li. *Chem. Commun.* 2019, 55, 2285–2288.
- *Uncoordinated amine groups of metal–organic frameworks to anchor single Ru sites as chemoselective catalysts toward the hydrogenation of quinoline.* X. Wang, W. Chen, L. Zhang, T. Yao, W. Liu, Y. Lin, H. Ju, J. Dong, L. Zheng, W. Yan, X. Zheng, Z. Li, X. Wang, J. Yang, D. He, Y. Wang, Z. Deng, Y. Wu, Y. Li. *J. Am. Chem. Soc.* 2017, 139, 9419–9422.
- *Atomically dispersed Ru on ultrathin Pd nanoribbons.* J. Ge, D. He, W. Chen, H. Ju, H. Zhang, T. Chao, X. Wang, R. You, Y. Lin, Y. Wang, J. Zhu, H. Li, B. Xiao, W. Huang, Y. Wu, X. Hong, Y. Li. *J. Am. Chem. Soc.* 2016, 138, 13850–13853.

TEACHING EXPERIENCE

- Teaching Assistant of College Physical Experiment Courses, USTC Mar. – Jul. 2018
- Teaching Assistant of College Physical Experiment Courses, USTC Sep. 2015 – Feb. 2016

HONORS & AWARDS

- **Outstanding Graduate Award for Doctoral Students (Top 5%)** 2021
- **Second Prize in American Chemical Society Student Chapter Competition** 2019
- **USTC Academic Scholarship (Grade 1)** 2016, 2018, 2019
- **China National Scholarship (Top 5%)** 2018
- **Tang Lixin Scholarship (Top 1%)** 2018
- **Outstanding Graduate Award (Top 5%)** 2016
- **Outstanding Graduate Thesis Award (Top 5%)** 2016
- **“Yuandong” Scholarship** 2014, 2015
- **Outstanding Student Scholarship** 2015
- **“Li Xun” Scholarship (Top 10%)** 2014
- **“Xingye” Responsibility Scholarship (Top 10%)** 2013

CONFERENCES ATTENDANCE

- *Membranes and Porous Materials for Vision 2030* Saudi Arabia, Mar. 20–22, 2023
- *AI for Energy* Saudi Arabia, Mar. 6–8, 2023
- *Rising Stars in AI Symposium 2023* Saudi Arabia, Feb. 19–21, 2023
- *Advances in Sustainable Catalysis* Saudi Arabia, Feb. 13–16, 2023
- *8th International Conference on Nanoscience and Technology* Beijing, China, Aug. 16–19, 2019
- *Emergent Materials and Devices: Electronic Structures and Properties* Chengdu, China, Apr. 12–14, 2019
- *13th Sino-US Symposium on Nanoscience and Nanotechnology* Chengdu, China, Jun. 29–Jul. 3, 2018
- *12th Sino-US Symposium on Nanoscience and Nanotechnology* Beijing, China, May 26–28, 2017
- *2nd International Symposium on Energy Chemistry and Materials* Hefei, China, Oct. 27–29, 2016
- *11th Sino-US Symposium on Nanoscience and Nanotechnology* Nanjing, China, Jun. 18–20, 2016
- *6th International Conference on Nanoscience and Technology* Beijing, China, Sep. 3–5, 2015