

WEIRAN ZHENG

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Department of Applied Biology and Chemical Technology ◇ The Hong Kong Polytechnic University
Hong Kong ◇ China

EDUCATION

Wuhan University	Wuhan, China
Ph.D. in Physical Chemistry	Sept., 2009 - Dec., 2015
Synthesis and Electrocatalytic Properties of Polymer-stabilized Noble Metal Nanoparticles	
Supervisor: Prof. S. C. E. Tsang (Oxford) and Prof. X.L. Hong (Wuhan)	
University of Oxford	Oxford, United Kingdom
Joint Ph.D. in Physical Chemistry	Oct., 2012 - Sept., 2014
Supported by Chinese Scholarship Council	
Wuhan University	Wuhan, China
B.S. in Chemistry	Sept., 2005 - June, 2009

RESEARCH EXPERIENCE

Hong Kong Polytechnic University	Hong Kong, China
Postdoctoral Research Fellow	May, 2016 - Present
Electrocatalysis	
· Establish <u>in-situ technique</u> (UV-Vis, Raman, and AFM) to study the morphological and structural evolutions of electrocatalyst during electrochemical process;	
· <u>Water splitting</u> (oxygen evolution reaction and hydrogen evolution reaction) study using 2D materials as the electrocatalyst;	
· <u>Glucose electrooxidation</u> using metal ion (Cu, Co, and Ni) as electrocatalyst;	
Battery Study	
· (2015-2016) Study of the electrode structure evolution (anode and cathode) after cycling test of commercial 18650 Lithium ion battery (project in collaboration with GP batteries international TM);	
· 2D materials as battery anode;	
Hong Kong Polytechnic University	Hong Kong, China
Research Assistant	Dec., 2014 - May, 2016
· <u>Carbon dioxide electroreduction</u> using conductive polymer (polyaniline) stabilized metal nanoparticle composite;	
· Development of glucose electrooxidation catalysts based on conductive polymer/graphene/metal nanoparticle composite;	
University of Oxford	Oxford, United Kingdom
Ph.D. Visiting Student	Oct., 2012 - Oct., 2014
· Development of conductive polymer (polythiophene, polyaniline)-metal nanoparticle composite for electrochemical and photochemical catalytic reaction: carbon monoxide electrooxidation, formic acid electrooxidation et al.;	
· Shape-controlled synthesis of Pd, Pt nanocrystals for formic acid decomposition and using in-situ FTIR technique for surface adsorbed species mapping;	

PEER-REVIEWED PUBLICATIONS

Details can be found via my ORCID (0000-0002-9915-6982) and Google scholar profile, with a h-index of 14 (January 28, 2021).

Co-first authorship

1. W. Zheng, Y. Li, C.-S. Tsang, L.Y.S. Lee, Stabilizer-Free Bismuth Nanoparticle for Selective Polyol Electrooxidation, 2021, submitted to iScience
2. W. Zheng,[#] Y. Li,[#] M. Liu, L.Y.S. Lee, Few-Layer Tellurium: Cathodic Exfoliation and Doping for Collaborative Hydrogen Evolution, 2021, submitted to Small

3. J. Choi,[#] D. Kim,[#] W. Zheng, B. Yan, Y. Li, L.Y.S. Lee, Y. Piao, Interface Engineered NiFe₂O_{4-x}/NiMoO₄ Nanowire Arrays for Electrochemical Oxygen Evolution, *Applied Catalysis B: Environmental*, 2021, 286, 119857
4. L. Hu,[#] Y. Li,[#] X. Peng, W. Zheng, L.Y.S. Lee, P.K. Chu, K.-Y. Wong, TiO₂ Film Supported by Vertically Aligned Gold Nanorod Superlattice Array for Enhanced Photocatalytic Hydrogen Evolution, *Chemical Engineering Journal*, 2021, 127900
5. W. Zheng, M. Liu, L.Y.S. Lee, Best Practices in Using Foam-Type Electrodes for Electrocatalytic Performance Benchmark, *ACS Energy Letters*, 2020, 5, 3260-3264
6. L. Hu, Y. Li, W. Zheng, Y.-K. Peng, S.C.E. Tsang, L.Y.S. Lee, K.-Y. Wong, Blue Order/Disorder Janus-Type TiO₂ Nanoparticles for Enhanced Photocatalytic Hydrogen Generation, *Journal of Materials Chemistry A*, 2020, 8, 22828-22839
7. W. Zheng,[#] J. Lee,[#] Z. Gao, Y. Li, S. Lin, S. P. Lau, L.Y.S. Lee, Laser-assisted Ultrafast Exfoliation of Black Phosphorus in Liquid with Tunable Thickness for Li-ion Batteries, *Advanced Energy Materials*, 2020, 10, 1903490 [Featured as the Front Cover](#)
8. X. Zhang,[#] K.-A. Min,[#] W. Zheng, J. Hwang, B. Han, L.Y.S. Lee, Copper Phosphosulfides as a Highly Active and Stable Photocatalyst for Hydrogen Evolution Reaction, *Applied Catalysis B: Environmental*, 2020, 273, 118927
9. W. Zheng,[#] M. Liu,[#] L.Y.S. Lee, Electrochemical Instability of Metal-Organic Frameworks: In Situ Spectroelectrochemical Investigation of the Real Active Sites, *ACS Catalysis*, 2020, 20, 81-92 [Highly cited paper, Clarivate](#)
10. W. Zheng, C.-S. Tsang, M. Liu, L.Y. So, L.-C. Leung, L.Y.S. Lee, Highly Efficient Stepwise Electrochemical Degradation of Antibiotics in Water by in situ Formed Cu(OH)₂ Nanorods, *Applied Catalysis B: Environmental*, 2019, 256, 117824
11. Z. Gao, M. Liu, W. Zheng, X. Zhang, L.Y.S. Lee, Surface Engineering of MoS₂ via Laser-induced Exfoliation in Protic Solvents, *Small*, 2019, 15, 1903791
12. Z. Gao, W. Zheng, L.Y.S. Lee, Highly Enhanced Pseudocapacitive Performance of Vanadium-doped MXenes in Neutral Electrolytes, *Small*, 2019, 15, 1902649
13. W. Zheng, Y. Li, L.Y.S. Lee, Insights into the Transition Metal Ion-mediated Electrooxidation of Glucose in Alkaline Electrolyte, *Electrochimica Acta*, 2019, 308, 9-19
14. W. Zheng,[#] C.-S. Tsang,[#] L.Y.S. Lee, K.-Y. Wong, Two-dimensional Metal-Organic Framework and Covalent-Organic Framework: Synthesis and their Energy-related Applications, *Materials Today Chemistry*, 2019, 12, 34-60 ([Review article](#))
15. W. Zheng, Y. Li, L. Hu, L.Y.S. Lee, Use of Carbon Supports with Copper Ion as a Highly Sensitive Non-Enzymatic Glucose Sensor, *Sensors & Actuators B: Chemical*, 2019, 282, 187-196
16. M. Liu, W. Zheng, S. Ran, S.T. Boles, L.Y.S. Lee, Overall Water Splitting Electrocatalysts based on 2D CoNi Metal-Organic Frameworks and Its Derivative, *Advanced Materials Interfaces*, 2018, 5, 1800849 [Featured as the Inside Cover](#)
17. Y. Li, L. Hu, W. Zheng, X. Peng, M. Liu, P. K. Chu, L. Y. S. Lee, Ni/Co-Based Nanosheet Arrays for Efficient Oxygen Evolution Reaction, *Nano Energy*, 2018, 52, 360-368
18. W. Zheng,[#] Y. Li,[#] M. Liu, C.-S. Tsang, L.Y.S. Lee, K.-Y. Wong, Cu²⁺-doped Carbon Nitride/MWCNT as an Electrochemical Glucose Sensor, *Electroanalysis*, 2018, 30, 1446-1454
19. W. Zheng, Y. Li, C.-S. Tsang, L. Hu, M. Liu, B. Huang, L.Y.S. Lee, K.-Y. Wong, Cu^{II}-mediated Ultra-efficient Electrooxidation of Glucose, *ChemElectroChem*, 2017, 4, 2788-2792
20. W. Zheng, H.W. Man, L. Ye, S.C.E. Tsang, Electroreduction of Carbon Dioxide to Formic Acid and Methanol over a Palladium/Polyaniline Catalyst in Acidic Solution: A Study of the Palladium Size Effect, *Energy Technology*, 2017, 5, 937-944
21. A. Kolpin, G. Jones, S. Jones, W. Zheng, J. Cookson, A. PE York, P. J Collier, S.C.E. Tsang, Quantitative Differences in Sulfur Poisoning Phenomena over Ruthenium and Palladium: An Attempt to Deconvolute Geometric and Electronic Poisoning Effects Using Model Catalysts, *ACS Catalysis*, 2017, 7, 592-605

22. W. Zheng, S. Nayak, W. Yuan, Z. Zeng, X. Hong, K.A. Vincent, S.C.E. Tsang, A Tunable Metal-polyaniline Interface for Efficient Carbon Dioxide Electro-Reduction to Formic Acid and Methanol in Aqueous Solution, *Chemical Communications*, 2016, 52, 13901-13904
23. W. Zheng, L. Hu, L.Y.S. Lee, K.-Y. Wong, Copper Nanoparticles/Polyaniline/Graphene Composite as a Highly Sensitive Electrochemical Glucose Sensor, *Journal of Electroanalytical Chemistry*, 2016, 781, 155-160
24. W. Zheng, J. Qu, X. Hong, K. Tedsree, S.C.E. Tsang, Probing the Size and Shape Effects of Cubic- and Spherical-Shaped Palladium Nanoparticles in the Electrooxidation of Formic Acid, *ChemCatChem*, 2015, 7, 3826-3831
25. S. Jones, S.M. Fairclough, M. Gordon-Brown, W. Zheng, A. Kolpin, B. Pang, W.C.H. Kuo, J.M. Smith, S.C.E. Tsang, Dual Doping Effects (Site Blockage and Electronic Promotion) Imposed by Adatoms on Pd Nanocrystals for Catalytic Hydrogen Production, *Chemical Communications*, 2015, 51, 46-49
26. K. Nakagawa, T. Jia, W. Zheng, S. M. Fairclough, M. Katoh, S. Sugiyama, S.C.E. Tsang, Enhanced Photocatalytic Hydrogen Evolution from Water by Niobate Single Molecular Sheets and Ensembles, *Chemical Communications*, 2014, 50, 13702-13705
27. W. Zheng, S. Jones, X. Hong, S.C.E. Tsang, Photo and Electronic Excitation for Low Temperature Catalysis Over Metal Nanoparticles Using an Organic Semiconductor, *RSC Advances*, 2014, 4, 47488-47496
28. J. Ge, Z. Zeng, F. Liao, W. Zheng, X. Hong, S.C.E. Tsang, Palladium on Iron Oxide Nanoparticles: the Morphological Effect of the Support in Glycerol Hydrogenolysis, *Green Chemistry*, 2013, 15, 2064-2069
29. F. Liao, Y. Huang, J. Ge, W. Zheng, K. Tedsree, P. Collier, X. Hong, S.C.E. Tsang, Morphology-dependent Interactions of ZnO with Cu Nanoparticles at the Materials' Interface in Selective Hydrogenation of CO₂ to CH₃OH, *Angewandte Chemie International Edition*, 2011, 50, 2162-2165
30. Y. Huang, F. Liao, W. Zheng, X. Liu, X. Wu, X. Hong, S.C.E. Tsang, Temperature and Solvent-dependent Morphological Sol-Gel Transformation: an in-situ Microscopic Observation, *Langmuir*, 2010, 26, 3106-3114

BOOK CHAPTER

1. W. Zheng, Y. Li, L.Y.S. Lee, Earth-Abundant Metal-Based Nanomaterials for Electrochemical Water Splitting, *Functional Nanomaterials: Synthesis, Properties and Applications*, Wiley-VCH, 2021

PATENTS

1. S.C.E. Tsang, W. Zheng, X. Hong, Synthesis and Application of Visible Light-responsive Metal-Organic Semiconductor Photocatalyst
Chinese patent: CN103406152B Granted 2015

RECENT ACADEMIC ACTIVITIES

- (invited) Laser-Assisted Exfoliation of Black Phosphorus with Thickness Control for Li-Ion Batteries, ECS Meeting Abstracts, Nov., 2020
- 5th International Summer School Spectroelectrochemistry, Leibniz Institute for Solid State and Materials Research (IFW), Dresden, Germany, Sep., 2019
- Workshop on Bruker™ Surface Probe Microscope, Guangzhou, China, Dec., 2018
- Oral report: CO₂ Electroreduction Using Metal/Conductive Polymer Composite, The 15th National Youth Conference on Catalysis, China, July, 2015
- Poster: Pd/Polythiophene as Photocatalyst for Environmental VOCs Decomposition, iChemE: Progress & Challenges in Environmental Catalysis, United Kingdom, June, 2014

FUNDINGS

- Design of High-efficient and High-selective Photoelectrochemical CO₂ Reduction Catalyst
Science Foundation of Shenzhen (JCYJ20170818105046904) 2018 - 2020
Co-P.I.
- Synthesis and Tuning of Cu/ZnO Nanocrystal Interfaces for Catalytic CO₂ Reduction
National Natural Science Foundation of China (21373153) 2012 - 2015
Co-P.I.

MEMBERSHIP OF PROFESSIONAL SOCIETIES

Chinese Chemical Society (CCS)	Since 2012
International Society of Electrochemistry (ISE)	Since 2019

TECHNICAL STRENGTHS

Data Analysis & Visualization	OriginLab, R-based language, Adobe Illustrator
Academic Software	ChemBioOffice, Crystal Maker, Cinema4D, L ^A T _E X, 3dsMax
Techniques	AFM (Bruker Certified SPM Operator), STM, Electrochemistry (CV, LSV, EIS, FTacV), XRD, TEM, SEM, FTIR in-situ electrochemical UV-Vis spectroscopy
Language	Chinese, English

ACADEMIC SERVICE

Reviewer for some peer-reviewed journals, including: Communications Chemistry, Sensors and Actuators B: Chemical.

Updated on January 28, 2021