

# ZI-SHENG ZHANG

Email: chemzisheng@gmail.com ◇ Tel: +86 13147005783

1088 Xueyuan Ave., Nanshan District, Shenzhen, Guangdong Province, 518055, China

## EDUCATION

|                                                                |                                       |
|----------------------------------------------------------------|---------------------------------------|
| <b>Southern University of Science and Technology (SUSTech)</b> | Sep 2015 - Jun 2018                   |
| Bachelor of Science, Chemistry (expected)                      | <b>GPA 3.87/4.00 (Ranking: 1/75)</b>  |
| <b>University of California, Los Angeles</b>                   | Jul 2018 - Sep 2018                   |
| Cross-disciplinary Scholar in Science and Technology (CSST)    | <b>GPA 4.00/4.00 (Ranking: 1/101)</b> |

## STANDARD TESTS

|                           |                                                 |               |
|---------------------------|-------------------------------------------------|---------------|
| <b>GRE General Test</b>   | <b>163 V (93%) + 170 Q (96%) + 3.5 AW (41%)</b> | Mar 5th 2017  |
| <b>GRE Chemistry Test</b> | <b>860 (93%)</b>                                | Oct 28th 2017 |
| <b>TOEFL Test</b>         | <b>111 (30 R + 29 L + 25 S + 27 W)</b>          | Sep 8th 2018  |

## PUBLICATION

1. **Zhang, Z.**; Jimenez-Izal, E.; Hermans, I.; Alexandrova, A. N. *Dynamic Phase Diagram of Catalytic Surface of Hexagonal Boron Nitride in Conditions of Oxidative Dehydrogenation of Propane*. **2018**, submitted.
2. Wang, Y.; Wang, M.; Jiang, Z.; Wang, Q.; Lucero, M.; Zhang, X.; **Zhang, Z.**; Li, X.; Gu, M.\*; Feng, Z.\*; Liang, Y.\* *Iron Phthalocyanine Precursors to Construct Efficient Single Iron Site Electrocatalysts for Oxygen Reduction Reaction*. **2018**, submitted.
3. Zhong, R.; **Zhang, Z.**; Luo, S.; Zhang, Z. C.; Huang, L.\*; Gu, M.\* *Comparison of TiO<sub>2</sub> and g-C<sub>3</sub>N<sub>4</sub> 2D/2D Nanocomposites from Three Synthesis Protocols for Visible-light Induced Hydrogen Evolution*. **2018**, Catalysis Science & Technology, accepted, DOI: 10.1039/C8CY00965A (Front cover highlight)
4. **Zhang, Z.**; Yang, T.; Qin, P.; Dang, L.\* *Nickel Bis(dithiolene) Complexes for Electrocatalytic Hydrogen Evolution: A Computational Study*. **2018**, Journal of Organometallic Chemistry, 864, 143-147.
5. Zhong, R.; **Zhang, Z.(equal contribution)**; Yi, H.; Zeng, L.; Tang, C.; Huang, L.\*; Gu, M.\* *Covalently Bonded 2D/2D O-g-C<sub>3</sub>N<sub>4</sub>/TiO<sub>2</sub> Heterojunction for Enhanced Visible-Light Photocatalytic Hydrogen Evolution*. **2018**, Applied Catalysis B: Environmental, 237, 1130-1138.
6. Zhang, X.; Wu, Z.; Zhang, X.; Li, L.; Li, Y.; Xu, H.; Li, X.; Yu, X.; **Zhang, Z.**; Liang, Y.\* and Wang, H.\* *Highly Selective and Active CO<sub>2</sub> Reduction Electrocatalysts Based on Cobalt Phthalocyanine/carbon Nanotube Hybrid Structures*. **2017**, Nature Communications, 8, 14675.

## RESEARCH EXPERIENCE

|                                                       |                     |
|-------------------------------------------------------|---------------------|
| <b>Department of Chemistry and Biochemistry, UCLA</b> | Jun 2018 - Nov 2018 |
| Advisor: Prof. Anastassia Alexandrova                 | CSST Summer Fellow  |

- Applied PSO global optimization combined with DFT calculation to investigate the structure of catalytic boride surface under realistic condition. Established a grand canonical ensemble to study ensemble-averaged surface free energy and Bader charge. Explored structural fluxionality of oxidized boride surface with MD.

|                                         |                          |
|-----------------------------------------|--------------------------|
| <b>Department of Chemistry, SUSTech</b> | Sep 2018 - Present       |
| Advisor: Prof. Jun Li                   | Undergraduate Researcher |

- Applied DFT calculation to study the mechanism and key reaction intermediates of CO<sub>2</sub>RR to rationally designed highly active and stable NiPc-based electrocatalyst for selective electroreduction of CO<sub>2</sub> to CO.

|                                                                      |                          |
|----------------------------------------------------------------------|--------------------------|
| <b>Department of Material Science and Engineering (MSE), SUSTech</b> | Jun 2016 - Present       |
| Advisor: Prof. Yongye Liang                                          | Undergraduate Researcher |

- Applied DFT calculation to investigating the reaction mechanism of ORR on molecularly engineered FePc. Constructing a FePc/CNT hybrid via  $\pi - \pi$  interactions to enhance electrocatalytic activity and stability.
- Fabricated single-atom catalysts for efficient ORR through pyrolysis of ZIF-8 with metal phthalocyanine being metal precursor. Funded by the Student's Platform for Innovation and Entrepreneurship Training Program.
- Designed and synthesized bimetallic Cu/Pd nanoparticles supported on oxidized CNT via an adopted co-strong electrostatic adsorption (SEA) method. Selective electroreduction of CO<sub>2</sub> to formate was achieved in a wide potential range. Poster presentation at Nature Conference: Materials Electrochemistry (Jan. 2018)
- Synthesized and tested CoPc/CNT hybrid for selective electrocatalytic reduction of CO<sub>2</sub>.

#### Department of Chemistry & Department of MSE, SUSTech

May 2017 - Oct 2018

Advisor: Prof. Limin Huang and Prof. Meng Gu

Undergraduate Researcher

- Designed and synthesized covalent TiO<sub>2</sub>/O-g-C<sub>3</sub>N<sub>4</sub> 2D/2D heterojunction through N-O-Ti covalent bonding, achieving enhanced visible-light photocatalytic activity comparing to heterojunctions fabricated by other methods. Applied DFT calculation to investigate the bonding at heterojunction interface, and performed thorough characterization of the interface via STEM, HRTEM, XPS and EELS.

#### Department of Chemistry, SUSTech

May 2017 - Mar 2018

Advisor: Prof. Li Dang

Undergraduate Researcher

- Applied DFT calculation to study the substituent effects on electrocatalytic HER using nickel bis(dithiolene) complexes. Developed an electrocatalytic activity descriptor based on pK<sub>a</sub> of dithiolene ligands. Delivered an oral presentation on ACS publications symposium: Innovation in Energy Conversion (Sept. 2017)

### RELATED SKILLS

**Experimental:** Nanomaterial Synthesis; XRD; TGA; DSC; BET; FL & PL spectroscopy; FT-IR; UV-vis DRS; NMR; SEM; TEM; EDX; GC; HPLC; ICP-MS; Electrochemical & photocatalytic measurements

**Programming & Softwares:** C, JAVA, Python, MatLab, Shell, L<sup>A</sup>T<sub>E</sub>X, SolidWorks, AutoCAD, PhotoShop

**Quantum Chemistry Programs:** Material Studio, Gaussian09 & 16, CALYPSO, VASP, CP2K, ORCA, MECP, VESTA, P4VASP, Multiwfn, GaussView, VMD, ASE, Jmol

### SCHOLARSHIPS & AWARDS

|                                                                     |                  |
|---------------------------------------------------------------------|------------------|
| Selected Best Presentations Award in CSST CHEM & MSE division, UCLA | Sep 2018         |
| CSST Scholarship, UCLA                                              | Jul 2018         |
| Outstanding Scientific Research Potential, Shuren College           | May 2018         |
| Merit-Based Undergraduate Scholarship, SUSTech                      | 2016, 2017, 2018 |

### EXTRACURRICULAR ACTIVITIES

#### American Chemistry Society (ACS), SUSTech Student Chapter

May 2018 - Present

*Vice President & Co-founder*

- Organized regular seminars for ACS student members to learn about latest hot papers and discuss interdisciplinary topics in frontiers of chemistry. Invited influential guest speakers to lead forums and seminars.

#### Material Research Society (MRS), SUSTech Student Chapter

May 2018 - Present

*Academic Department Leader & Co-founder*

- Organized regular seminars for MRS student members to learn about latest hot papers and discuss interdisciplinary topics in frontiers of materials.

#### Student Union of Shuren College, SUSTech

Sep 2015 - Sep 2016

*Senior Member and Main Contributor, Academic Department*

- Initiated a series of School-wide activities, such as public speaking contests and student-professor meetups.
- Participated in the agenda scheduling, order maintaining and press release