Lei Pan

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https://planetpolly.github.io

EDUCATION

University of Michigan, Ann Arbor, USA Jan. 2019 - Dec. 2019 (expected)
***Master* in Chemistry**
Major GPA: **4.00**/4.00, Overall GPA: **4.00**/4.00

Shanghai Jiao Tong University, China Sept. 2014 - Jun. 2018
***Honors Bachelor of Science* in Chemistry**
Member of Zhiyuan Honors Program, an elite program for top 5% of students.
Bachelor Thesis:**Low temperature Synthesized Two-Dimensional Porous Alloys for Electrochemical Catalysis**
Major GPA: **3.56**/4.00 (**87.36**/100), Overall GPA: **3.60**/4.00 (**88.00**/100)

RESEARCH INTERESTS

Artificial photosynthesis, Energy Related Inorganic Materials, Chemistry of Surface and Interface

RESEARCH EXPERIENCES

Self-assembled Monolayers' Desorption Behaviors Jan. 2019 - Present
***Research Internship, Supervised by* Prof. Charles McCrory** *University of Michigan, Ann Arbor*

- Designed a strategy-proof and efficient mechanism for desorption behavior of the mixed thiols' system, by constructing an optimal deposition environment via electrochemical measurements, and characterizing it with X-ray photo-electron Spectra (XPS).
- Built a truthful methods for controlling the composition of mixed self-assembled monolayer, via adjusting pH values and deposition solvent recipes.

Pyrochlore-Type Yttrium Ruthenate Materials for Oxygen Evolution Reaction Jul. 2017 - Jan. 2018
***Research Assistant, Supervised by* Prof. Hong Yang** *University of Illinois at Urbana - Champaign*

- Designed an acid-stable electrocatalysts with low overpotential for oxygen evolution reaction (OER), based on Lanthanide Contraction, via introducing heteroatoms to adjust the lattice structure, optimally improved its stability.
- Proposed a promising activity descriptor for OER, linking the pyrochlore structure constant and its catalysis performance, based on the aforementioned research.
- Designed a high-surface-area Yttrium Ruthenium Oxide material for OER, adopting polyvinyl alcohol as scaffolds, realizing low-temperature synthesis and avoiding structural collapse.

Platinum-based Two Dimensional Metals for Methanol Oxidation Reaction Nov. 2016 - Jul. 2018
***Research Assistant, Supervised by* Prof. Jianbo Wu** *Shanghai Jiao Tong University*

- Designed 2D alloys containing elements of Platinum group and Iron group, through carbon monoxide involved ethylene glycol-thermo synthesis, and studied morphology-controllable recipes according to the LaMer Growth Model
- Developed a rational mechanism with time-controlled experiments: the ethylene glycol reduces Platinum first, then forms a two-dimensional net-like polymer and induces the other metal depositing in the same plane.
- Studied a descriptor for Methanol Oxidation Reaction and other electrochemical reactions, focusing on the structures' adjustment in Pt atoms by inserting Iron groups, which essentially tunes the surface capacity adsorbing some active intermediates.

Total Synthesis of a Spiro Compound by Semi-Pinacol Rearrangement Jul. 2015 - Oct. 2016
***Research Intern, Supervised by* Prof. Shuyu Zhang** *Shanghai Jiao Tong University*

- Synthesized a series of spiro compounds by semi-Pinacol rearrangement

- Revised their performance as ligands with platnium catalysts by combining various functional groups

A Novel Complex Probe for Selective Recognition of the Hydroxycarboxylate Apr. 2015 - Mar. 2016
PRP Program, Supervised by Prof. Qinghua Meng *Shanghai Jiao Tong University*

- Prepared a novel complex probe for selective recognition of the hydroxycarboxylate, which could differentiate the gluconate with other sugars.
- Characterized by titration, visible spectrophotometry, calculated the structure parameters and coordination constants and computed the possible active intermediate.
- Proposed a fluorescence-quenching model, explained the exception on sodium gluconate

PUBLICATIONS

[1] **Lei Pan**, Wenlong Chen, Jianbo Wu, Low-Temperature Synthesized 2D Porous Platinum Cobalt Nanosheets for Electro-catalytic Methanol Oxidation Reaction, in preparation for submission, 2019.

[2] Yanling Ma, Wenpei Gao, Jialiang Xu, Fan Li, Peter Tieu, Yi Wu, Wenlong Chen, **Lei Pan**, Xiaoqing Pan and Tao Deng, Low-temperature Surface Atomic Ordering on PtFe Nanowires for Active and Stable Oxygen Reduction Reaction, submitted to *Nature Nanotechnology*, 2019.

[3] Wenlong Chen, Yanling Ma, Fan Li, **Lei Pan**, Wenpei Gao, Qian Xiang, Wen Shang, Chengyi Song, Peng Tao, Hong Zhu, Xiaoqing Pan, Tao Deng and Jianbo Wu*, Strong electronic interaction of amorphous Fe_2O_3 nanosheets with single atom Pt towards enhanced carbon monoxide oxidation, accepted by *Advanced Functional Materials*, 2019

PATENTS

Wenlong Chen, Qian Xiang, Fan Li, Yanling Ma, Fenglei Shi, **Lei Pan**, et al. Carbon Monoxide Involved Platinum-based Two-Dimensional Material Synthesis Method, China Patent, submitted, 2019.

EXTRACURRICULAR

Trainee Journalist of *Global Science* magazine, the Chinese edition of *Scientific American* Aug. 2017 - Present
Teaching Assistant of International Course: Introduction to Spectroscopy Jun. 2018 - Aug. 2018
Teaching Assistant of International Course: Introduction to Biophysics Jun. 2018 - Aug. 2018
Tutoring in Mathematics Jan. 2016 - Jan. 2017
Co-organizer of *Surpass Union*, online platform for students' academic communication Sept. 2016 - Jun. 2017
Co-organizer of *Green Pass*, an online platform for students' schoolwork communication Sept. 2015 - Jul. 2016
Administrative Assistant in Zhiyuan College, Shanghai Jiao Tong University Jan. 2018 - Jul. 2018
Core Member of Student Union Advocacy Center Mar. 2016 - Jun. 2017

TECHNICAL SKILLS

Professional Tools: Electrochemical Measurements, MS Modeling, Gaussian 03W, Chem Draw, Origin
Instruments: TEM, SEM, XRD, XPS
Programming: HTML, CSS
Other: Blender, LaTeX, Adobe Series, Excel

HONORS AND AWARDS

The National Inspiration Award, China (National) Oct. 2017
Academic Excellence Scholarship (top 3%) Oct. 2015, 2016, 2017
Zhiyuan Honors Scholarship (**top 5%**) Oct. 2016, 2017
Suzhehu Inspiration Scholarship (**top 3%**) May 2017
Hanyingjuhua Inspiration Scholarship (**top 3%**) May 2015, 2016, 2017, 2018
Shuping Scholarship (**Shanghai**) Oct. 2014, 2015, 2016
Renwenyu Inspiration Scholarship (**top 3%**) May 2015, 2016, 2017, 2018
Award for Oversea Undergraduate Research May 2018