Towards photocatalytic water splitting in homogeneous solutions using molecular metalloporphyrin photosensitizers and catalysts

Liu, C.

CURRICULUM VITAE

Chengyu Liu was born in Jilin, China in September 1990. He obtained his bachelor degree from the Faculty of Chemistry of Jilin University in 2013. His research topic was "Inorganic synthesis of nanocrystals as materials for lithium-ion battery electrodes". During his BSc study, he was awarded with the "Excellent Student" prize of the faculty and the "2nd-class scholarship" of Jilin University. Then, he moved to Beijing in 2014, where he started his research on "Electrocatalytic oxygen reduction using molecular catalysts" as a master student at the Faculty of Science of Renmin University of China, supervised by Prof. Rui Cao. In 2017, he obtained his Master's degree in chemistry with the award of "Outstanding Graduate of the Universities in Beijing". The same year, he moved to Leiden University in the Netherlands where he started his PhD study under the supervision of Prof. Sylvestre Bonnet and Prof. Elisabeth Bouwman. His research work in the Metals in Catalysis, Biomimetics & Inorganic Materials (MCBIM) group was entitled "Towards the light-driven water splitting in homogeneous solutions using molecular metalloporphyrin photosensitizers and catalysts". During his PhD, he supervised two BSc students (Barthold den Hartog and Dennis van der Meij) and two MSc students (Daan van den Bos and Roy Maas). He had several collaborations, working with Dr. Santiago Rodriguez Jimenez, Marion Isabelle May and Prof. Erwin Reisner from the University of Cambridge (UK), and Titus de Haas, Dr. Francesco Buda, Dr. Mingchuan Luo, and Prof. Marc T. M. Koper from Leiden University. He followed the courses "Advanced Metal-Organic Chemistry" and Catalysis and "High Impact Writing Course", provided by the Holland Research School of Molecular Chemistry (HRSMC), and the "Scientific Conduct" course provided by the Graduate School of Leiden University. He also attended and presented some of his research work at the following conferences:

- The Netherlands' Catalysis and Chemistry Conference (**NCCC**), **2018**, **2019** and **2020**, in Noordwijkerhout, The Netherlands
- Chemistry as Innovating Science (**CHAINS**), **2018** and **2019**, in Veldhoven, The Netherlands
- Holland Research School of Molecular Chemistry (**HRSMC**) **Symposium**, **2018** and **2019**, in Amsterdam, The Netherlands
- **Reedijk Symposium**, **2019**, Leiden, The Netherlands
- The International Solar Fuels Conference (**ISFC**), **2021**, Online, UK

LIST OF PUBLICATIONS

Published:

1. **Liu, C.**; van den Bos, D.; den Hartog, B.; van der Meij, D.; Ramakrishnan, A.; Bonnet, S., Ligand Controls the Activity of Light-Driven Water Oxidation Catalyzed by Nickel(II) Porphyrin Complexes in Neutral Homogeneous Aqueous Solutions. *Angew. Chem. Int. Ed.* **2021,** *60* (24), 13463-13469.

2. **Liu, C.**; Lei, H.; Zhang, Z.; Chen, F.; Cao, R., Oxygen reduction catalyzed by a water-soluble binuclear copper(II) complex from a neutral aqueous solution. *Chem. Commun.* **2017,** *53* (22), 3189-3192.

3. Lei, H.; **Liu, C.**; Wang, Z.; Zhang, Z.; Zhang, M.; Chang, X.; Zhang, W.; Cao, R., Noncovalent Immobilization of a Pyrene-Modified Cobalt Corrole on Carbon Supports for Enhanced Electrocatalytic Oxygen Reduction and Oxygen Evolution in Aqueous Solutions. *ACS Catal.* **2016,** *6* (10), 6429-6437.

4. Lei, H.; Chen, M.; Liang, Z.; **Liu, C.**; Zhang, W.; Cao, R., Ni2P hollow microspheres for electrocatalytic oxygen evolution and reduction reactions. *Catal. Sci. Technol.* **2018,** *8* (9), 2289-2293.

In preparation:

1. **Liu, C.**; de Haas, T.; Amati, A.; Buda, F.; Bonnet, S., Electronic Effect in Water-soluble Zn(II) and Sn(IV) Porphyrin Photosensitizers for Homogeneous Photocatalytic Hydrogen Evolution at pH 7.0.

2. **Liu, C.**; de Haas, T.; Bouwman, E.; Buda, F.; Bonnet, S., Effects of Electron-Withdrawing and Electron-Donating Substituents on the pH Dependence of Co(III)-porphyrin Catalysts for Homogeneous Photocatalytic Hydrogen Evolution.

3. **Liu, C.**; Amati. A.; Klein. D. M.; Bonnet, S., A Simple Approach Towards the Application of Lipophilic Molecular Catalysts for Light-driven Hydrogen Evolution from Neutral Aqueous Solutions.