

CURRICULUM VITAE for Dr. Han Sen SOO

Contact Information

Hansen@ntu.edu.sg
21 Nanyang Link, SPMS-CBC-05-03
Division of Chemistry and Biological Chemistry
School of Physical and Mathematical Sciences
Nanyang Technological University, Singapore 637371
<http://www.ntu.edu.sg/home/hansen/Webpage/Public/Main.htm>

Employment History

Nanyang Assistant Professor (1 April 2013), Chemistry and Biological Chemistry Division, School of Physical and Mathematical Sciences, Nanyang Technological University, Singapore, September 2012 –

- Independently taught CM 9091: Industrial and Environmental Chemistry (Jan – May 2013 – 2017)
- Co-taught 17th & 18th SM2 CM1021: Basic Inorganic Chemistry (Aug – Nov 2013 & 2014)
- Co-taught CM 3021: Organometallic Chemistry (for Year 3; Aug – Nov 2015 & 2016)

Post-Doctoral Fellow, Physical Biosciences Division and Helios Solar Energy Research Center, Lawrence Berkeley National Laboratory, Berkeley, CA 2010 – 2012 (Heinz Frei)

- Development of integrated systems for artificial photosynthesis

Graduate Student Researcher and Instructor, Department of Chemistry, University of California, Berkeley, Berkeley, CA 2005 – 2009 (Christopher J. Chang)

- Thesis for Ph.D. “Small Molecule Activation, Group Transfer, and Redox Reactivity of Iron, Cobalt, and Manganese Centers with New First and Second Coordination Sphere Scaffolds”

Undergraduate Research Assistant, Massachusetts Institute of Technology, Cambridge, MA 1999 – 2003 (Christopher C. Cummins)

- Thesis for S.M. “Synthetic and Mechanistic Investigations on Tantalum, Molybdenum, and Copper Complexes Supported by Novel Enolate and Macrocyclic Ligands”

Education

Ph.D., Chemistry, University of California, Berkeley, December 2009

S.M., Chemistry, Massachusetts Institute of Technology, June 2003

S.B., Chemistry, Massachusetts Institute of Technology, June 2003

Publications

1. Gazi, S.; Dokić, M.; Moeljadi, A. M. P.; Ganguly, R.; Hirao, H.; Soo, H. S.* “Kinetics and DFT Studies of Photoredox Carbon-Carbon Bond Cleavage Reactions by Molecular Vanadium Catalysts under Ambient Conditions,” *ACS Catal.* **2017**, *7*, 4682 – 4691.
2. Wang, J.; Ganguly, R.; Li, Y.; Díaz, J.; Soo, H. S.*; García, F. “ Synthesis and the Optical and Electrochemical Properties of Indium(III) Bis(arylimino)acenaphthene Complexes,” *Inorg. Chem.* **2017**, *56*, 7811 – 7820.
3. Thirumal, K.; Chong, W. K.; Xie, W.; Ganguly, R.; Muduli, S. K.; Sherburne, M.; Asta, M.; Mhaisalkar, S.; Sum, T. C.; Soo, H. S.*; Mathews, N. “Morphology-Independent Stable White-Light Emission from Self-Assembled Two-Dimensional Perovskites Driven by Strong Exciton–Phonon Coupling to the Organic Framework,” *Chem. Mater.* **2017**, *29*, 3947 – 3953.
4. Gong, Y.; Wang, D. P.; Wu, R.; Gazi, S.; Soo, H. S.*; Sritharan, T.; Chen, Z. “New Insights into the Photocatalytic Activity of 3-D Core–Shell P25@Silica Nanocomposites: Impact of Mesoporous Coating,” *Dalton Trans.* **2017**, *46*, 4994 – 5002.
5. Kee, J. W.; Shao, H.; Kee, C. W.; Lu, Y.; Soo, H. S.*; Tan, C. H. “Mechanistic Insights for the Photoredox Organocatalytic Fluorination of Aliphatic Carbons by Anthraquinone Using Time-Resolved and DFT Studies,” *Catal. Sci. Technol.* **2017**, *7*, 848 – 857.
6. Das, S. P.; Ganguly, R.; Li, Y.; Soo, H. S.* “Nucleophilic reactivity and electrocatalytic reduction of halogenated organic compounds by nickel *o*-phenylenedioxamate complexes,” *Dalton Trans.* **2016**, *45*, 13556 – 13564.
7. Koh, T. M.; Thirumal, K.; Soo, H. S.*; Mathews, N. “Multidimensional Perovskites: A Mixed Cation Approach Towards Ambient Stable and Tunable Perovskite Photovoltaics,” *ChemSusChem*, **2016**, *9*, 2541 – 2558.
8. Shao, H.; Muduli, S. K.; Tran, D. P.; Soo, H. S.* “Enhancing Electrocatalytic Hydrogen Evolution by Nickel Salicylaldimine Complexes with Alkali Metal Cations in Aqueous Media,” *Chem. Commun.*

- 2016, 52, 2948 – 2951.
9. Wang, J.; Ganguly, R.; Li, Y.; Díaz, J.; Soo, H. S.*; García, F. "Multi-Step Solvent-Free Mechanochemical Route to Indium(III) Complexes," *Dalton Trans.* **2016**, 45, 7941 – 7946.
 10. Hong, Z.; Ong, D. Y.; Muduli, S. K.; Too, P. C.; Chan, G. H.; Tnay, Y. L.; Chiba, S.*; Nishiyama, Y.*; Hirao, H.*; Soo, H. S.* "Understanding the Origins of Nucleophilic Hydride Reactivity of Sodium Hydride-Iodide Composite," *Chem. Eur. J.*, **2016**, 22, 7108 – 7114 (featured as "hot paper").
 11. Kee, J. W.; Ng, Y. Y.; Kulkarni, S. A.; Muduli, S. K.; Xu, K.; Ganguly, R.; Lu, Y.; Hirao, H.; Soo, H. S.* "Development of Bis(arylimino)acenaphthene (BIAN) Copper Complexes as Visible Light Harvesters for Potential Photovoltaic Applications," *Inorg. Chem. Front.* **2016**, 3, 651 – 662.
 12. Gazi, S.; Ng, W. K. H.; Ganguly, R.; Moeljadi, A. M. P.; Hirao, H.; Soo, H. S.* "Selective photocatalytic C–C bond cleavage under ambient conditions with earth abundant vanadium complexes," *Chem. Sci.* **2015**, 6, 7130 – 7142.
 13. Muduli, A. K.; Wang, S.; Chen, S.; Ng, C. F.; Huan, A. C. H.; Sum, T. C.; Soo, H. S.* "Mesoporous cerium oxide nanospheres for the visible-light driven photocatalytic degradation of dyes," *Beilstein J. Nanotechnol.* **2014**, 5, 517 – 523.
 14. Macnaughtan, M. L.; Soo, H. S.; Frei, H. "Binuclear ZrOCo Metal-to-Metal Charge-Transfer Unit in Mesoporous Silica for Light-Driven CO₂ Reduction to CO and Formate" *J. Phys. Chem. C* **2014**, 118, 7874 – 7885.
 15. Agiral, A.; Soo, H. S.; Frei, H. "Visible Light Induced Hole Transport from Sensitizer to Co₃O₄ Water Oxidation Catalyst across Nanoscale Silica Barrier with Embedded Molecular Wires," *Chem. Mater.* **2013**, 25, 2264 – 2273.
 16. Soo, H. S.; Agiral, A.; Bachmeier, A.; Frei, H. "Visible Light-Induced Hole Injection into Rectifying Molecular Wires Anchored on Co₃O₄ and SiO₂ Nanoparticles," *J. Am. Chem. Soc.* **2012**, 134, 17104 – 17116.
 17. Soo, H. S.; Macnaughtan, M. L.; Weare, W. W.; Yano, J.; Frei, H. "EXAFS Spectroscopic Analysis of Heterobinuclear TiOMn Charge-Transfer Chromophore in Mesoporous Silica," *J. Phys. Chem. C* **2011**, 115, 24893 – 24905.
 18. Soo, H. S.; Sougrati, M. T.; Grandjean, F.; Long, G. J. Chang, C. J. "A Seven-Coordinate Iron Platform and its Oxo and Nitrene Reactivity," *Inorg. Chim. Acta* **2011**, 369, 82 – 91.
 19. Harris, T. D.; Soo, H. S.; Chang, C. J.; Long, J. R. "A Cyano-Bridged Fe^{II}Re^{IV}(CN)₂ Cluster Incorporating Two High-Magnetic Anisotropy Building Units," *Inorg. Chim. Acta* **2011**, 369, 91 – 96.
 20. Soo, H. S.; Komor, A. C.; Iavarone, A. T.; Chang, C. J. "A Hydrogen-Bond Facilitated Cycle for Oxygen Reduction by an Acid- and Base-Compatible Iron Platform," *Inorg. Chem.* **2009**, 48, 10024 – 10035.
 21. Demoin, D. W.; Pluth, M.; Soo, H. S.; Xu, Y. "Dimethoxyphosphinoyl phenyl ketone *p*-tolylsulfonylhydrazone," *Acta Cryst. E* **2006**, 62, 3551 – 3552.
 22. Soo, H. S.; Figueroa, J. S.; Cummins, C. C. "A Homoleptic Molybdenum(IV) Enolate Complex: Synthesis, Molecular and Electronic Structure, and NCN Group Transfer to Form a Terminal Cyanoimide of Molybdenum(VI)," *J. Am. Chem. Soc.* **2004**, 126, 11370 – 11376.
 23. Soo, H. S.; Diaconescu, P. L.; Cummins, C. C. "A Sterically Demanding Enolate Ligand: Tantalum Ligation and Pyridine Coupling," *Organometallics* **2004**, 23, 498 – 503.

Patent

1. Soo, H. S.*; Gazi, S.; Dokic, M. "Selective carbon-carbon bond cleavage by earth abundant vanadium compound under visible light photocatalysis", Singapore provisional patent 10201500823Q, filed 3 February 2015, International PCT application PCT/SG2016/050056, filed 3 February 2016.
2. Thirumal, K.; Mhaisalkar, S.; Mathews, N.; Soo, H. S. "Zero-Dimensional Metal Halide Perovskite Phosphors For Solid-State Lighting", technology disclosure TD/097/17, filed April 2017.

Recent Awards

APA Prize for Young Scientists 2016, The Asian and Oceanian Photochemistry Association
Nanyang Assistant Professorship, Nanyang Technological University, 2013