Wan-Fang (Laura) Chou

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RESEARCH INTERESTS

Inorganic and Organic Synthesis Chemistry, Material Chemistry, Surface Chemistry of Semiconductor, Organometallic Chemistry, Sustainability, Polymer Chemistry

EDUCATION

Claremont Graduate University, Claremont, CA, USA Sep. 2017 – May 2019
Master of Information Systems and Technology (GPA: 4.00/4.00)
Specialization: *Data Science and Analytics*

- Relevant courses: Database and Big Data, CS Insights via Python Programming, Cyber Security Risk Management, Knowledge Discovery and Data Mining, Data Analytics & Info Visualization, Communications and Networking
- Fellowship: CGU Fellowship, EduCo Scholarship

National Tsing Hua University, Hsinchu, Taiwan Feb. 2014 – Feb. 2016
Master of Chemistry (GPA: 4.08/4.3)
Specialization: Inorganic Synthesis and Organometallic Catalysis
Thesis: "Reactivity Study Between the Mo-Mo Multiply Bonded Complexes and Organic Nitriles"

National Taiwan Normal University, Taipei, Taiwan Sep. 2009 – Jun. 2013
Bachelor of Science in Chemistry (GPA: 3.91/4.00)

RESEARCH EXPERIENCE

Novel Quintuply Bonded Multinuclear Complexes Synthesis and Reactivity Research Laboratory, National Tsing Hua University (NTHU) 2014 – 2016
Research Assistant
Advisor: Prof. Yi-Chou Tsai

[1] **Synthesis of Novel β-diketiminates (Nacnac) to Give A New Ligand Scaffold**

- Substituted one carbon atom on backbone of Nacnac ligand for electron-withdrawing boron atom
- Compared differences between products from different ligands
- Used novel ligand to react with transition metals to obtain result complexes
- Synthesized inverted-sandwich chromium complex supported by boron-containing ligand

[2] **Reactivity Study Between the Mo-Mo Multiply Bonded Complexes and Organic Nitriles**

- "Study on Similarity Between Metal-Metal Quintuple Bonds and Unsaturated Hydrocarbons and Synthesis of Novel Quintuply Bonded Multinuclear Complexes," National Science Council (Grants NSC 102-2113-M-007-015-MY3) of Taiwan
- Changed amidinate ligand into boraamidinate ligand to support Mo-Mo multiple bonds; formed three kinds Mo-Mo multiply bonded complexes: $Mo_2[\mu\text{-}\kappa^2\text{-}PhB(N\text{-}2,6\text{-}^iPr_2C_6H_3)_2]_2$ (**1**), $[(THF)(K\text{-}18\text{-}C\text{-}6)]Mo_2[\mu\text{-}\kappa^2\text{-}PhB(N\text{-}2,6\text{-}^iPr_2C_6H_3)_2]_2$ (**2**) and $[(THF)_2(K\text{-}18\text{-}C\text{-}6)]_2Mo_2[\mu\text{-}\kappa^2\text{-}PhB(N\text{-}2,6\text{-}^iPr_2C_6H_3)_2]_2$ (**3**)
- Observed and identified reactivity between multiply bonded compounds and different nitriles

Biochemical Mass Spectrometry Research Laboratory
National Taiwan Normal University (NTNU) 2013
Research Assistant
Advisor: Dr. Sung-Fang Chen

[3] **Comparative Proteome Analysis of PLC/PRF/5 Cell Line Stimulated by HCC Drugs via Chemical Labeling and Mass Spectrometry**

- Used human liver cancer cell line, PLC/PRF/5, stimulated by three HCC drugs (Sorafenib, Selumetinib, and Sunitinib)
- Observed difference of proteome performance between these three results
- Analyzed four samples via Mass Spectrometry: PLC/PRF/5, PLC/PRF/5+Sorafenib, PLC/PRF/5+Selumentinib, and PLC/PRF/5+Sunitinib; used iTRAQ to tag these four samples

- Adopted three types of fractionation to classify each sample: solution isoelectric focusing (sIEF), strong cation exchange chromatography (SCX), and basic reversed-phase chromatography (basic RP)
- Analyzed samples using mass spectrometry; determined which peptides were influenced by HCC drugs

WORKING EXPERIENCE

Taiwan Semiconductor Manufacturing Company (TSMC), Hsinchu, Taiwan 2016 – 2017
Process Engineer, *Department of Diffusion*

- Identified semiconductor manufacturing processes and conducted process optimization to improve yield and raise efficiency and quality of fabrication
- Resolved production problems to ensure equipment's conditions and wafer delivery
- Supervised diffusion process and new materials evaluation for 10 nm/7 nm manufacturing process

[1] **Defect Detection and Diffusion Process Correction**

- Clarified defective products and developed alternative track recipes to enhance products' yield and maintain quality

[2] **New Tools Examination for 10nm and 7nm Manufacturing Process**

- Examined new uSSA tools, KDFAD1 and KDFAD2, passed PCCB (Process Change Control Board) for 10 nm and 7 nm-manufacturing and confirmed quality for mass production
- Examined new ISSG tools, GDIGAB passed PCCB for 10 nm and 7nnm process and confirmed quality for mass production

PROJECTS

[1] **Database System Design for a Sales Transaction Application** (Database and Big Data Course)

- Analyzed data and designed tables to improve system efficiency and achieve client's goals
- Used SQL to create efficient way to retrieve data and define security for different departments

[2] **Nitrogen Cycle in 3D (VPython)** (CS Insights via Python Programming Course)

- Utilized Python library to design project
- Used Python to create simple, vivid animation of chemical reactions

[3] **Data Mining Techniques in Analyzing The Characteristics of Students In Loan Risks** (Knowledge Discovery and Data Mining Course)

- Employed data mining software, SAS Enterprise Mining, to analyze potential characteristics that may affect student loan risks based on client's requirements
- Utilized data mining techniques, such as decision trees, clustering, and regression; adjusted parameters to obtain best methods

TEACHING EXPERIENCE

General Chemistry Laboratory Course, NTHU
Teaching Assistant 2014 – 2016

- Instructed undergraduate students in fundamental chemistry principles and experiments
- Designed general chemistry experiments and introduced them to first-year students

CONFERENCE

WOCJC-9, Tokyo, Japan Nov. 2014
Poster: Inverted-Sandwich Complexes Supported by a Boron-Containing Ligand
Presentation: Inverted-Sandwich Complexes Supported by a Boron-Containing Ligand

- Award: Best Poster Award

SKILLS

Chemistry: Organic and inorganic synthesis, analytical chemistry
Tools: NMR (^{1}H, ^{13}C, COSY, and HSQC), HPLC, Glove Box
Programming: Python, R, SQL, Oracle, Data Mining, SAS Enterprise Miner, Tableau, Cyber Security

LANGUAGE

Mandarin Chinese and Taiwanese (native), English (fluent), French (basic)