

Semi 200

Education

University of Oregon

M.S. August 2018

Photovoltaics & Semiconductor Device Processing

Colorado School of Mines, Golden, CO

B.S. May 2017

Dual Degree: Chemical Engineering, Chemistry

GPA: **3.74**

Skills/Strengths

Programs: Excel, Visual Basic for Applications (VBA), ASPEN Plus, ChemDraw, Visio

Laboratory: Ellipsometry, LCR, 4 point probe, Keithly 2400 SMU, Oxide growth, HF etching, Metal deposition, Spin Coating, Mask Alignment, H¹, C¹³, NMR spectral analysis, FTIR analysis, GC-MS, XRD

Technical Projects and Employment

Colorado School of Mines Senior Design-Low Pressure Ammonia Plant

Spring 2017

- Designed a low pressure ammonia plant using cryogenic distillation and water gas shift reactions to produce feedstock nitrogen and hydrogen by researching existing methods
- Incorporated Dr. Colin Wolden and Dr. Doug Way's novel Vanadium membrane reactor into the commercial scale design of ammonia production, which operates at 10atm, an order of magnitude lower pressure than commercial Haber-Bosh reactors
- Collaborated with other students to produce a cohesive 110 page report detailing design parameters, ASPEN model results and development, and economic outcomes of the ammonia plant design
- Sized and costed over 30 lab, pilot and commercial scale unit operations using design heuristics with the aid of excel and VBA program to develop economic sensitivity analysis
- Initiated contact with the Merichem company to receive cost estimates for sulfur removal out of natural gas feed stock using patented LO-CAT technology. As a result, the LO-CAT system was only viable for the pilot scale.

Chemical Engineering and Chemistry Field Session Lab projects

Summer 2016

- Efficiently used time management skills in a three-person team to complete multiple experiments and analysis
- Completed high volume of data processing on heat exchangers, distillation columns, fixed bed adsorption, tank heating, friction factor piping, and adiabatic cooling to identify operational adherence to theory
- Posited non-idealities in unit operations such as pipe fouling and confirmed hypothesis using plausibility and statistical analysis

Colorado School of Mines Researcher-Organic Synthesis, Sellinger Group

December 2015-May 2016

- Synthesized para-terphenyl derivatives using air-free Schlenk techniques for use in plastic scintillators and presented at the biannual CSM chemistry poster session
- Learned about the innerworkings of plastic scintillators to understand the importance of synthesis and solubility tests in the greater scheme of commercial application

Colorado School of Mines Researcher- Characterizing Solar cells, Wolden Group

August 2014- December 2015

- Characterized thin film thickness and crystallinity using ellipsometry and XRD after depositing films via sputtering in order to aid in the characterization of MoC thin films
- Measured UV-vis transmittance and absorbance measurements and capacitance-voltage curves of completed thin film CdTe solar cells devices to aid in characterizing their performance
- Operated FESEM, ESEM and EDX to detect impurities and confirm crystal of CdTe solar cells

STRATA Geotech Internship, Spokane, WA

June – August 2014

- Successfully sorted and purged 7 years of documentation within 2 months, and suggested a more efficient organizational system which was implemented at the end of the internship
- Showed initiative by helping collate last minute presentation packets for potential clients and organizing the backroom during downtime

Work Experience

Organic Chemistry Tutoring via American Chemical Society involvement

Summer 2015-Spring 2017

- Mentored organic chemistry students to accomplish a comprehensive understanding of organic synthesis via mechanistic teaching resulting in at least one grade letter bump per mentee
- Related to students to come up with an individualized study plan for finals week that worked with their existing time priorities and other finals
- Coordinated catering and planned event logistics for 5 ACS events including the pilot “MinesCraft” which showcased CSM chemistry departmental research to over 300 students
- Presented at the 251st national ACS conference in San Diego on the success of the CSM ACS student chapter
- Planned campus and community outreach events in a large team setting. Planned events included: public annual chemistry demonstrations and a CSM alumni fundraising event

Awards

- Robert A. Baxter Award - highest departmental academic standing in the Colorado School of Mines Chemistry Department (Spring 2017)
- Organic chemistry award -highest test scores in the department (Spring 2015)
- Nominated for Oppenheimer award - illumination of issues surrounding the 30 year Kaminoseki nuclear power plant conflict (Spring 2014)