

ABDULAZIZ (AZIZ)ALHERZ

ABDULAZIZ.ALHERZ@COLORADO.EDU

EDUCATION

University of Colorado, Boulder

B.S. Chemical Engineering

May 2016

M.S. Chemical Engineering

May 2018

Ph.D. Chemical Engineering

Expected: May 2021

Selected Coursework: Inorganic Chemistry, Physical Chemistry, Molecular Simulations

ENGINEERING/RESEARCH EXPERIENCE

Ph.D. Thesis, PI: Charles Musgrave, Boulder, CO

May 2018-Present

- Studying Nickel Phosphides as outstanding CO₂RR electrocatalysts
- Investigating optimum experimental conditions for CO₂RR by metal-free hydrides

Master's Thesis, PI: Charles Musgrave, Boulder, CO

Aug 2016-May 2018

- Analyzed thermodynamics and kinetics to predict potential molecules for catalysis of CO₂ to fuels
- Studied existing and proposing new systems that can reduce CO₂ to fuels using renewable hydrides

Undergraduate Researcher, PI: Charles Musgrave, Boulder, CO

Jan. 2014-May 2016

- Calculated thermodynamic properties of molecules, reactions, and transition states
- Determined relationship between Nucleophilicity and activation energy of reactions
- Investigated the correlation between the hydricity the HOMO-LUMO energy gap
- Performed quantum chemical techniques to analyze the mechanism behind the Tanaka system

PUBLICATIONS

- **Alherz, A.W.**, Lim, C.H. and Musgrave, C.B. Predicting Hydride Donor Strength via Quantum Chemical Calculations of Hydride Transfer Activation Free Energy (JPC-B, 2018)
- **Alherz, A.W.**, Lehmann, P., Lim, C.H. and Musgrave, C.B. Renewable Hydride Donors for the Catalytic Reduction of CO₂: A Thermodynamic and Kinetic Study (JPC-B, 2018)

LEADERSHIP EXPERIENCE

Project Manager, Focused Labs Oils, Denver, CO

Aug 2015-May 2016

- Proposed improvements for systems to extract CBD from hemp using supercritical CO₂
- Performed design of experiment analysis to determine optimal operating conditions

Teaching Assistant, Material and Energy Balances, CU-Boulder, Boulder, CO

Summer 2015

- Provided focused daily student development sessions
- Organized planning and decision-making with senior instructor and associate chair

Advanced Teaching Assistant, Thermodynamics, CU-Boulder, Boulder, CO

Fall 2015

- Presented 3 lectures on non-ideal liquid mixtures and activity coefficients
- Conducted weekly student homework help sessions
- Helped create exam questions

TECHNICAL SKILLS

Lab Techniques: Program Logic Control, NMR, IR Spectroscopy, Chromatography, Distillation, Extraction

Software: AspenPlus, COMSOL, Gaussian, HYSYS, MATLAB, MiniTab, PolyMath, VASP, jDFTx, Python