Curriculum Vitae

Seongjoo Jung

jung0318@umn.edu | +1-651-359-8084 | seongjoojung.github.io

Education

University of Minnesota — Minneapolis, MN, USA
Ph.D. Candidate, Chemical Engineering (GPA 4.00/4.00) — 2020–present
Department of Chemical Engineering and Material Science (CEMS)
Advisors: Turan Birol, Paul J. Dauenhauer

Seoul National University — Seoul, Korea
Bachelor of Science, Major in Chemical and Biological Engineering — 2015–2020
Minor in Computer Science and Engineering
Honors: summa cum laude
Advisors: Yung-Eun Sung

Research Experiences

Graduate Researcher, University of Minnesota — 2020–present

- Discovered octahedral rotation-induced P-E hysteresis loops in perovskite materials.
- Developed polarized-ground state calculation for metal/insulator heterostructure for VASP (commercial ab initio quantum mechanical calculations software) using Fortran and Python.
- Analyzed $Pt/PbTiO_3$ systems at different support polarization geometrically and electronically using Bader, DDEC6 charges, (integrated) PDOS, real-space charge density, demonstrating interface effects on surface active sites.
- Predicted adsorption energy changes related to d-band structure changes, and discovered breaking of transition-state scaling relations using CI-NEB.

Research Intern, Seoul National University and Korea Center for Artificial Photosynthesis — 2018–2019

- Synthesized $CuInS_2$-based photocathode for photoelectrochemical CO_2 reduction, using electro/chemical depositions.
- Performed multilayer electrodes analysis with XRD, XPS, SEM, EDX, product analysis with GC and ^1H NMR.
- Analyzed electrochemical reactions with LSV, CV, CA, Tafel plot and EIS Nyquist plot.

Awards and Honors

Kokes Award — 2023

- North American Catalysis Society

The Lanny & Charlotte Schmidt and Duane Goetsch & Nancy M. Dickerson Fellowship — 2021

- CEMS, University of Minnesota

Fridley Fellowship — 2021

- CEMS, University of Minnesota

Peter and Gene Pierce Fellowship — 2021

- CEMS, University of Minnesota

Samsung Convergence Software Course Scholarship 2017–2020

- Samsung Electronics. Minor program with scholarship for selected non-computer science major students

National Scholarship for Science and Engineering (full tuition) 2015–2020

- Ministry of Science and ICT, Korea. Provided full tuition coverage for 48 months

External Research Resources

Discover ACCESS Allocations 2023–2024

- National Science Foundation

ACCESS (formerly XSEDE) Startup Allocations 2022–2023

- National Science Foundation

Teaching

Teaching Assistant, University of Minnesota

- ChEn 3101: Chemical Engineering Thermodynamics Spring 2023
  - Head TA and Recitation TA. Taught 10 sessions of recitation to students, provided office hours and supplementary course materials.
- ChEn 4401W: Senior Chemical Engineering Lab (Unit Ops) Fall 2021
  - Lab TA for distillation, gas membrane separation, non-Newtonian pipe flow, ion exchange, humidification & water-cooling experiments. Grading TA for humidification & water-cooling experiment.

Talks and Conferences

American Physical Society March Meeting, Minneapolis, MN Mar 2024

"Rotation Induced Antiferroelectric-like Double Hysteresis of Perovskites"

North American Catalysis Society Meeting, Providence, RI Jun 2023

"Support Polarization Control of Catalysts: Elucidating and Breaking Scaling Relations"

Gordon Conference – Catalysis, New London, NH (Accepted) Jun 2022

"Catalyst Charge Injection via Polarized Ferroelectric Support-Metal Interaction"

Programming Skills

(From Most Used) Python; MATLAB; Java; Unix; LaTeX; HTML/CSS; JavaScript; Git; PyTorch; C; C++; FORTRAN;

Publications

Jung S., Pizzolitto C., Biasi P., Dauenhauer P. J., Birol, T. "Programmable Catalysis by Support Polarization: Elucidating and Breaking Scaling Relations", *Nature Communications* **14**, 7795 (2023)

Jung S., Dauenhauer P. J., Birol, T. "Rotation-Induced, Antiferroelectric-like Double Hysteresis of Perovskites" (Manuscript available upon Request)