Dylan Weber

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Education

DOCTOR OF PHILOSOPHY IN CHEMICAL ENGINEERING | GEORGIA TECH *GPA: 3.62*
· Thesis: Modeling and Simulation of Industrial Membrane Processes Using Complex Mixtures *Class of 2023*
for Integration in Process Simulation Environments
· Thesis Advisor: Dr. Joseph K. Scott · Minor: Numerical Optimization

BACHELOR OF SCIENCE IN CHEMICAL ENGINEERING | CLEMSON UNIVERSITY *GPA: 3.19*
· Emphasis area: Polymeric Materials *Class of 2018*

Graduate Research Experience

SIMULATION OF COMPLEX MIXTURE MEMBRANE TRANSPORT *Aug 2021-Aug 2023*
· Proposed a novel simulation method for complex mixture permeation which will enable, for the first
time, proper techno-economic analysis within chemical process flowsheeting software.
- This novel implementation is the most accurate and robust compared to the state-of-the-art
  numerical methods and has been released as a MATLAB package for industrial and academic use.

PREDICTIVE MODELING OF ORGANIC SOLVENT REVERSE OSMOSIS *Aug 2019-Aug 2021*
· Developed one thermodynamic and two different diffusional models that could better predict glassy
polymer permeation experiments.
- Reduced average predicted error by 50% for 3, 5, & 9 component complex mixtures permeating
  across 2 glassy polymers using our models based solely on single component experimental parameters.

Relevant Work Experience

VIA SEPARATIONS, INC. | PROCESS MODELING AND SIMULATION | CO-OP *Jul-Dec 2022*
· Progressed modeling and simulation competency of start-up company for black liquor concentration through
  graphene oxide membranes to cut 1% of U.S. energy costs due to pulp & paper industry separations.
- Elucidated characterization methods, optimized synthetic black liquor recipes, performed permeation
  experiments, proposed transport model, and coded process simulation capabilities to allow for
  better system design for future commercial installments. *Boston, MA*

FUJIFILM, INC. | PHOTOGRAPHIC PROUCTS DIVISION | CO-OP *May-Aug 2017*
· Collected and analyzed trend data for root cause analysis of defects in multilayer high speed
coating line.
· Implemented small scale recipe development into manufacturing testing.
- Experimented with various factor changes in industrial laboratory. *Greenwood, SC*

Entrepreneurship Experience

HANDMADE JEWELRY AND KEEPSAKES | GROUND2JEWLS *Dec 2023-Present*
Atlanta, GA
LANDSCAPING & ODD JOBS | WEBER LANDSCAPING *May 2013-Aug 2014*
Greenville, SC
RETRO GAMAING SALES & REPAIRS| WISE GUYS ELECTRONICS *May 2008-Aug 2013*
Greenville, SC

Skills

Programming: MATLAB, Python, C, Aspen Custom Modeler
Software: Aspen Plus, CHEMCAD, gPROMS Process Builder, CAPE-OPEN, LaTeX, Git
Numerical Simulation Methods: Approximation Methods, Discretization, Shooting Algorithms
Numerical Optimization: Liner Optimization, Non-linear Optimization, Real Analysis

Leadership Experience

INSPECTIONS TEAM LEADER | GRADUATE STUDENT SAFETY COMMITTEE   *Jan-Dec 2023*
· Coordinated, communicated, and executed inspections of ChBE labs across Georgia Tech Campus with a team of fellow colleagues.

SUMMER PROJECT TEAM LEADER | SCOTT RESEARCH GROUP   *May-Aug 2020*
· Undertook evaluation, direction, progression of an internal research team to investigate novel complex mixture adsorption modeling and simulation methods.

Publications

1. D.J. Weber, R. Mathias, R.P. Lively, J.K. Scott. "Improved Numerical Methods for Simulating Complex Mixture Transport Across Asymmetric Polymer Membranes using a Maxwell-Stefan Model." *Journal of Membrane Science* 687, 121995 (2023).
2. Y.J. Lee[†], L. Chen[†], J. Nistane, H.Y. Jang, D.J. Weber, J.K. Scott, N.D. Rangnekar, B.D. Marshall, W. Li, J.R. Johnson, N.C. Bruno, M.G. Finn, R. Ramprasad, R.P. Lively. "Data-driven predictions of complex mixture permeation in polymer membranes." *Nature Communications* 14, 4931 (2023). [†]Authors contributed equally.
3. C. J. Roos, D.J. Weber, H.Y. Jang, R.P. Lively. "Matching analysis of mixed matrix membranes for organic solvent reverse osmosis." *Industrial & Engineering Chemistry Research* 61, 9, 3395–3411 (2022).
4. R. Mathias[†], D.J. Weber[†], K.A. Thompson, B.D. Marshall, M.G. Finn, J.K. Scott, R.P. Lively. "Framework for predicting the fractionation of complex liquid feeds via polymer membranes." *Journal of Membrane Science* 640, 119767 (2021). [†]Authors contributed equally.

Conference Presentations

1. D.J. Weber, J.K. Scott. "Modeling and Simulation of Electrodialysis Processes for Nutrient Recovery from Wastewater." Oral Presentation, AIChE Annual Meeting, Orlando, 2023 (Presenting in November 2023).
2. D.J. Weber, C.C. Chen, J.K. Scott. "A Critical Comparison of Numerical Methods for Solving Coupled Multicomponent Fluxes for Complex Mixtures across Asymmetric Membranes." Oral Presentation, AIChE Annual Meeting, Boston, 2021.
3. D.J. Weber, J.K. Scott. "Advancing Modeling and Simulation Capabilities for Complex Solvent Mixture Membrane Separations." Poster Presentation, AIChE Annual Meeting, Boston, 2021.
4. D.J. Weber, C.C. Chen, J.K. Scott. "Utilizing the MATLAB CAPE-OPEN Unit Operation to Make Real Hydrocarbon Mixture Membrane Separation Predictions." Oral Presentation, CAPE-OPEN Annual Meeting, Virtual, 2021.
5. D.J. Weber, R. Mathias, R.P. Lively, J.K. Scott. "On the Numerical Solution of Rigorous Membrane Module Models Involving Nonideal Multicomponent Mixtures." Oral Presentation, AIChE Annual Meeting, Virtual, 2020.
6. D.J. Weber, R. Mathias, R.P. Lively, J.K. Scott. "An Efficient and Reliable Numerical Method for Computing Coupled Multicomponent Fluxes for Complex Mixtures Across Asymmetric Membranes." Oral Presentation, AIChE Spring Meeting, Virtual, 2020.