

ZHEYU JIANG

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EDUCATION

- Ph.D., Purdue University**, Chemical Engineering 2014 – 2018
Advisors: Prof. Rakesh Agrawal and Prof. Mohit Tawarmalani
- B.Ch.E. (Honors), University of Minnesota** 2010 – 2014
Advisor: Prof. Michael Tsapatsis

PROFESSIONAL EXPERIENCE

Corteva Agriscience, Agriculture Division of DowDuPont December 2018 – Present
Process Development Engineer

- Proposed, modeled, and experimentally validated a novel solvent recovery strategy for one of the key steps in synthesizing a fungicide product that could save up to 60% in solvent cost

Prof. Rakesh Agrawal Group, Purdue University August 2014 – October 2018
Graduate Research Assistant

- Solved a longstanding challenge in chemical engineering of developing a shortcut based method to determine the minimum reflux condition for any multi-feed, multi-product distillation column separating ideal multicomponent mixtures
- Developed the first enumeration based global optimization algorithm to identify distillation configurations that can potentially save up to 50% of total cost or total exergy loss compared to conventional schemes
- For the first time, proposed a systematic multi-layer approach for process intensification in multicomponent distillation, offering industrial practitioners an easy-to-follow recipe to synthesize numerous new and intensified configurations that further enhance operability, improve efficiency, and reduce total costs

The Dow Chemical Company May 2016 – August 2016
PhD Internship

- Designed new distillation systems for several Dow's star processes that could save up to 10-15% in energy consumption compared to their current most effective technologies
- Hosted weekly meetings involving R&D, engineering, and business experts regarding potential innovation and retrofit opportunities for implementing these newly identified configurations

Prof. Michael Tsapatsis Group, University of Minnesota November 2012 – May 2014
Undergraduate Research Assistant

- For the first time, developed a solution processable method to achieve purification of sub-100 nm thin film of exfoliated MFI zeolite nanosheets using density gradient centrifugation
- Optimized the process that prepared α -alumina membrane support for MFI nanosheet coating, leading to ten-fold increase in fabrication efficiency and consistent improvement in support quality
- Investigated on complete removal of organic structural directing agent in MFI nanosheets by acid treatment

Honeywell UOP June 2013 – August 2013
Internship

- Created new UniSim based simulation flowsheets for UOP's Oleflex and FCC processes and successfully built their activity coefficient models to describe the VLE and LLE for all major components involved
- Established a crude oil thermodynamic properties databank for major global oil reserves

PUBLICATIONS

1. AGRAWAL, K. V., TOPUZ, B., JIANG, Z., NGUENKAM, K., ELYASSI, B., FRANCIS, L. F., TSAP-ATSI, M., AND NAVARRO, M. Solution-processable exfoliated zeolite nanosheets purified by density gradient centrifugation. *AIChE Journal* 59, 9 (2013), 3458–3467
2. JIANG, Z., MADENOOR RAMAPRIYA, G., TAWARMALANI, M., AND AGRAWAL, R. Minimum energy of multicomponent distillation systems using minimum additional heat and mass integration sections. *AIChE Journal* 64, 9 (2018), 3410–3418
3. JIANG, Z., MADENOOR RAMAPRIYA, G., TAWARMALANI, M., AND AGRAWAL, R. Process intensification in multicomponent distillation. *Chemical Engineering Transactions* 69 (2018), 841–846
4. JIANG, Z., MATHEW, T. J., HUFF, J., NALLASIVAM, U., TAWARMALANI, M., AND AGRAWAL, R. Global optimization of multicomponent distillation configurations: Global minimization of total cost for multicomponent mixture separations. *Computers & Chemical Engineering* 126 (2019), 249–262
5. JIANG, Z., AND AGRAWAL, R. Process intensification in multicomponent distillation: A review of recent advancements. *Chemical Engineering Research and Design* 147 (2019), 122–145
6. JIANG, Z., CHEN, Z., HUFF, J., SHENVI, A., TAWARMALANI, M., AND AGRAWAL, R. Global minimization of total exergy loss of multicomponent distillation configurations. Under Review
7. JIANG, Z., TAWARMALANI, M., AND AGRAWAL, R. An accurate minimum reflux calculation method for multi-feed, multi-product distillation columns distilling ideal multicomponent mixtures: 1. Mathematical model. (Working Paper)
8. JIANG, Z., TAWARMALANI, M., AND AGRAWAL, R. An accurate minimum reflux calculation method for multi-feed, multi-product distillation columns distilling ideal multicomponent mixtures: 2. Optimization model and case studies. (Working Paper)

PRESENTATIONS

1. JIANG, Z., TAWARMALANI, M., AND AGRAWAL, R. Minimum reflux behavior of multicomponent mixture separation using complex distillation columns. 2018 AIChE Annual Meeting, Pittsburg, PA
2. JIANG, Z., TAWARMALANI, M., AND AGRAWAL, R. A new minimum reflux calculation method for multiple-feed distillation columns distilling ideal multicomponent mixtures. 2017 AIChE Annual Meeting, Minneapolis, MN
3. JIANG, Z., TAWARMALANI, M., AND AGRAWAL, R. Process intensification in multicomponent distillation. 2017 AIChE Annual Meeting, Minneapolis, MN
4. JIANG, Z., TAWARMALANI, M., AND AGRAWAL, R. Process intensification in multicomponent distillation. 2017 AIChE Spring Meeting, San Antonio, TX
5. JIANG, Z., MADENOOR RAMAPRIYA, G., TUMBALAM GOOTY, R., TAWARMALANI, M., AND AGRAWAL, R. Minimum energy of multicomponent distillation systems using minimum additional number of heat and mass integration sections. 2016 AIChE Annual Meeting, San Francisco, CA
6. JIANG, Z., MADENOOR RAMAPRIYA, G., TUMBALAM GOOTY, R., TAWARMALANI, M., AND AGRAWAL, R. Process intensification of multicomponent distillation configurations using minimum additional number of heat and mass integration sections. 2016 AIChE Annual Meeting, San Francisco, CA
7. JIANG, Z., MADENOOR RAMAPRIYA, G., TUMBALAM GOOTY, R., TAWARMALANI, M., AND AGRAWAL, R. A method for minimization of total exergy loss over the complete search space of regular distillation configurations. 2016 AIChE Annual Meeting, San Francisco, CA

HONORS AND AWARDS

Separations Division Graduate Student Research Award, AIChE	2018
Eastman Graduate Travel Grant, Purdue University	2017
Purdue Graduate Student Government Travel Grant, Purdue University	2016
Global Excellence Scholarship, UMN	2010 – 2014
College of Science and Engineering Merit Scholarship, UMN	2012 – 2013
Charles A. Mann Award, Department of Chemical Engineering, UMN	2012 – 2013

SKILLS

Computer Languages	Java, Python
Software & Tools	L ^A T _E X, HTML, MATLAB, GAMS, Aspen Plus, Aspen Hysys, UniSim
Characterization	SEM, basic familiarity of TEM

ACTIVITIES

First-Year Representative	2015 – 2016
<i>Purdue Chemical Engineering Graduate School Organization (GSO)</i>	
Graduate Teaching Assistant	Fall 2015
<i>CHE 378 – Heat and Mass Transfer</i>	
Graduate Teaching Assistant	Spring 2017
<i>CHE 450 – Design and Analysis of Process Systems</i>	