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Professor

B.S. in Chemical Engineering
UC Berkeley, 2001

Ph.D. in Chemical Engineering
UC Santa Barbara, 2005

Research and Professional Interests

Industrial Crystallization

Process Design and Intensification

Journal Papers

1. H. Y. Lee, T. Y. Huang, P. H. Lee and **J. D. Ward**, "Design and control of a process to produce furan from furfural", *Journal of the Taiwan Institute of Chemical Engineers*, 73, 62-74, 2017(Apr), (IF: 3.763)
2. Y. T. Tseng and **J. D. Ward**, "Comparison of objective functions for batch crystallization using a simple process model and Pontryagin's minimum principle", *Computers & Chemical Engineering*, 99, 271-279, 2017(Apr), (SCI,EI), (IF: 3.334)
3. H. Y. Wang, K. L. Tung and **J. D. Ward**, "Design and economic analysis of membrane-assisted crystallization processes", *Journal of the Taiwan Institute of Chemical Engineers*, 81, 159-169, 2017(Dec), (SCI,EI), (IF: 3.763)
4. Y. S. Kang and **J. D. Ward**, "Analysis of Seed Loading and Supersaturation Trajectories for Two-Dimensional Crystallization Systems", *Industrial & Engineering Chemistry Research*, 56(38), 10798-10812, 2017(Sep), (SCI,EI), (IF: 3.448)
5. K. L. Wu, H. Y. Wang and **J. D. Ward**, "Economic Comparison of Crystallization Technologies for Different Chemical Products", *Industrial & Engineering Chemistry Research*, 57(37), 12444-12457, 2018(Sep), (SCI,EI), (IF: 3.448)
6. X. L. Yang and **J. D. Ward**, "Extractive Distillation Optimization Using Simulated Annealing and a Process Simulation Automation Server", *Industrial & Engineering Chemistry Research*, 57(32), 11050-11060, 2018(Aug), (SCI,EI), (IF: 3.448)
7. Y. W. Ni and **J. D. Ward**, "Automatic Design and Optimization of Column Sequences and Column Stacking Using a Process Simulation Automation Server", *Industrial & Engineering Chemistry Research*, 57(21), 7188-7200, 2018(May), (SCI,EI), (IF: 3.448)
8. Y. T. Tseng, H. J. Pan and **J. D. Ward**, "Pareto-Optimal Fronts for Simple Crystallization Systems Using Pontryagin's Minimum Principle", *Industrial & Engineering Chemistry Research*, 58(31), 14239-14251, 2019(Aug), (SCI,EI), (IF: 3.448)
9. P. C. Su and **J. D. Ward**, "Modeling of Membrane-Assisted Seeded Batch Crystallization", *Industrial & Engineering Chemistry Research*, 58(36), 16787-16797, 2019(Sep), (SCI,EI), (IF: 3.448)
10. L. D. Shiau, H. Y. Wu and **J. D. Ward**, "Modeling and design of a semi-continuous fluidized bed pellet reactor", *Desalination and Water Treatment*, 150, 58-72, 2019(May), (SCI), (IF: 1.29)
11. Tsai, T. Y.; Ward, J. D., Automatic Column Sequencing and Optimization for Homogeneous Azeotropic Mixtures. *Ind Eng Chem Res* **2020**, 59, (40), 17964-17976,

(SCI,EI), (IF: 3.448)

12. Lin, W. E.; Huang, P. H.; Ward, J. D., Regions of Optimality for Separation System Synthesis Using Rigorous Modeling, Stochastic Optimization, and Column Stacking. *Ind Eng Chem Res* **2020**, 59, (26), 12164-12175. (SCI,EI), (IF: 3.76)
13. Pan, H. J.; Ward, J. D., Optimization of Simple Batch Crystallization Systems Considering Crystal Shape and Nucleation. *Ind Eng Chem Res* **2020**, 59, (20), 9550-9561. (SCI,EI), (IF: 3.76)
14. Ni, Y. W.; Lin, W. E.; Tang, W. T.; Ward, J. D., Plantwide optimization coupled with column sequencing and stacking using a process simulator automation server. *Comput Chem Eng* **2021**, 146. (SCI,EI), (IF: 3.76)
15. Pan, H. J.; Ward, J. D., Dimensionless Framework for Seed Recipe Design and Optimal Control of Batch Crystallization. *Ind Eng Chem Res* **2021**, 60, (7), 3013-3026. (SCI,EI), (IF: 3.76)
16. Pan, H.-J.; Ward, J. D., Computationally Efficient Algorithm for Solving Population Balances with Size-Dependent Growth, Nucleation, and Growth-Dissolution Cycles. *Ind Eng Chem Res* **2021**, 60, (34), 12614-12628. (SCI,EI), (IF: 3.76)
17. Fang, M. C.; Pan, H. J.; Ward, J. D.; Lee, H. Y.; Hsieh, C. T.; Lin, S. C.; Hsieh, Y. C.; Lee, C. L.; Huang, T. H.; Chou, W. T., Modeling and analysis for cleaner operation of a process to remove BTX from coke oven gas. *Sep Purif Technol* **2022**, 302. (SCI,EI), (IF: 9.136)
18. Lee, I.; Chang, T.; Chang, C.; Truong, V. H.; Ward, J. D., Comparison of open- and closed-loop operating strategies for exhaust gas scrubbing in marine applications: Modeling and sea-trial data. *PROCEEDINGS OF THE INSTITUTION OF MECHANICAL ENGINEERS PART M-JOURNAL OF ENGINEERING FOR THE MARITIME ENVIRONMENT* **2022** (SCI,EI), (IF: 1.322)
19. Tang, W. T.; Ward, J. D. Comparison of Separation Alternatives for Two Industrial C6–C7 Aliphatic Hydrocarbon Mixtures Including Stacked Complex Sequences. *Ind Eng Chem Res* **2022**. <https://doi.org/10.1021/acs.iecr.2c00756>. (SCI,EI), (IF: 4.326)
20. Tang, W. T.; Ward, J. D. Stacked complex sequences for ternary zeotropic distillation. *Comput Chem Eng* **2022**, 161, 107744. (SCI,EI), (IF: 4.326)
21. Kang, Y.-S.; Ward, J. D.; Nagy, Z. K., A new framework and a hybrid method for one-dimensional population balance modeling of batch thermocycling crystallization. *Comput Chem Eng* **2022**, 157, 107588. (SCI,EI), (IF: 4.326)

Conference Papers

1. H. F. Hsieh and **J. D. Ward**, "Empirical trajectories for batch crystallization control with constraints.", The 6th International Symposium on Advanced Control of Industrial Processes (ADCONIP 2017) Taipei, Taiwan, 2017(May)

2. W. Chen, H. C. Cho and **J. D. Ward**, "Control of two batch crystallization processes with apparent growth-rate dispersion.", The 6th International Symposium on Advanced Control of Industrial Processes (ADCONIP 2017) Taipei, Taiwan, 2017(May)
3. X. L. Yang and **J. D. Ward**, "Design of a Pressure-Swing Distillation Process for the Separation of n-Hexane and Ethyl Acetate Using Simulated Annealing", Process Systems Engineering PSE 2018, San Diego California, 2018(Jul)
4. Y. W. Ni and **J. D. Ward**, "Plantwide Process Design with Automatic Column Optimization, Sequencing and Stacking Using a Rigorous Process Simulator", 2018 AIChE Annual Meeting, Pittsburgh PA, 2018(Oct)
5. K. L. Wu and **J. D. Ward**, "Ward Economic Analysis of Alternative Continuous Crystallization Technologies for Mass Production", 2018 AIChE Annual Meeting, Pittsburgh PA, 2018(Oct)
6. X. L. Yang and **J. D. Ward**, "Design of Extractive Distillation Processes Using Simulated Annealing and a Rigorous Process Simulator", 2018 AIChE Annual Meeting, Pittsburgh PA, USA, 2018(Oct)
7. Pan, H. J., Tseng, Y. T., and **Ward, J. D.**, "Pareto-optimal fronts for simple crystallization systems using optimal control theory.", Asia Pacific Confederation of Chemical Engineering (APCChE), Sapporo, Japan, 2019(Sep)
8. Pan, H. J., Tseng, Y. T., and **Ward, J. D.**, "Multi-Objective Optimization of Simple Crystallization Systems", 2019 AIChE Annual Meeting, Orlando, FL, USA, 2019(Nov)
9. Pan, H. J.; Ward, J. D. Optimal Control of Crystal Shape and Nucleation in Crystallization Processes. 2020 Virtual AIChE Annual Meeting, November 16–20, 2020.
10. Pan, H. J.; Ward, J. D. Determining Recipes for Seeded Batch Crystallization for Many Chemical Systems with Optimal Control Theory and a Dimensionless Framework. 2020 Virtual AIChE Annual Meeting, November 16–20, 2020.
11. Hou, H. Y.; Fang, Y. F; Ward, J. D. Optimization of extractive distillation processes with mixed solvents. 9th Asian Symposium on Process Systems Engineering (PSE Asia 2020), Taipei, Taiwan 4–6 Nov 2020.

Honors and Others

1. 榮獲臺灣大學 104 學年度教學優良獎(2016/08)
2. Secretary of the National Organizing Committee of the 6th International Symposium on Advanced Control of Industrial Processes (ADCONIP 2017)
3. 2020 NTU college of engineering academic award (國立臺灣大學工學院學術勵進獎)
4. 2017 Outstanding paper award Taiwan Institute of Chemical Engineering
5. 2016 Outstanding Mentoring Award (Department of Chemical Engineering, NTU)

6. 2022 NTU Exceptional Performance Award
7. 2022 NTU Outstanding English Teaching Award (學年度全英語授課教學優良獎)

