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Educational Qualification (all in chemical engineering)

◆ PhD	Indian Institute of Technology Kharagpur	2004
◆ MTech (Masters)	Indian Institute of Technology Kharagpur	2000
◆ BE (Bachelors)	Jadavpur University	1998

Awards & Recognition

- ◆ Fulbright Fellowship, Massachusetts Institute of Technology (MIT), USA, 2025-26
- ◆ Fellow of the Institution of Chemical Engineers (FIChemE), UK, 2025
- ◆ Chartered Chemical Engineer, UK, 2025
- ◆ Fellow of the Royal Society of Chemistry (FRSC), London, UK, 2023
- ◆ Fellow of the Alexander von Humboldt Foundation, TU Dortmund, Germany, 2017
- ◆ Faculty Excellence Award (for Outstanding Contributions towards Research, Teaching and Institutional Development) by IIT Kharagpur, India, 2021
- ◆ Listed in the “World’s Top 2% Scientists” by Stanford University, USA, 2020 – 2024

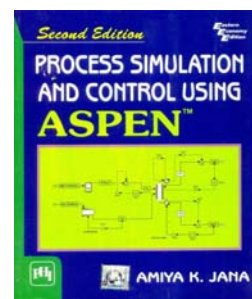
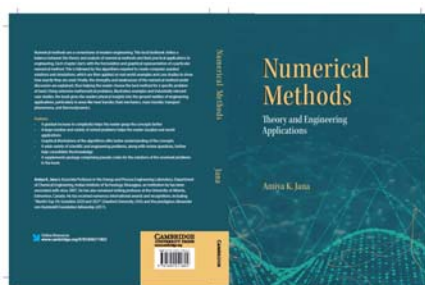
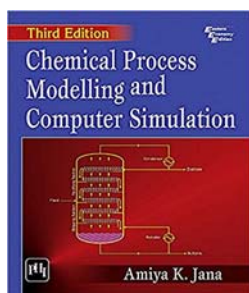
Editorial Board Member

- ◆ International Journal: Scientific Reports (Nature Group, UK), Since 2023
- ◆ International Journal: Frontiers in Control Engineering (Frontiers Publisher, Switzerland), Since 2020

Publications

Text Book

- (1) **Jana, A. K.** (2024). “Numerical Methods: Theory and Engineering Applications,” 1st edn., **Cambridge University Press**, Cambridge, UK (ISBN: 978-1-009-21180-2): 665 pages.
- (2) **Jana, A. K.** (2018). “Chemical Process Modelling and Computer Simulation,” 3rd edn., **Prentice-Hall**, New Delhi (ISBN: 978-93-87472-07-5): 468 pages.
- (3) **Jana, A. K.** (2012). “Process Simulation and Control using Aspen™,” 2nd edn., **Prentice-Hall**, New Delhi (ISBN: 978-81-203-4568-3): 372 pages



International Journal (selected publications @ 12% single-authored)*

- (146) Thakran, R. and **Jana, A. K.** (2025). “Desalinating Seawater with Zero Carbon Emission and Cogeneration of Electricity: Optimal Configuration with Process Intensification,” *ACS Sustainable Chemistry & Engineering* (In Press) [ACS].
- (145) Bagani, M. S., **Jana, A. K.**, Sharma, S. (2025). “Modeling and Optimization Study of Gas Hydrates: Validation at Reservoir-Mimicking Conditions,” *Chemical Engineering Research and Design* (Accepted) [Elsevier].
- (144) Bagani, M. S., Sharma, S., **Jana, A. K.** (2025). “Predicting the Thermo-Kinetics of sII Structure with Parameter-Free Hydrate Phase Description: Validation and Derivative-Free Optimization,” *Energy & Fuels*, 39, 14562-14571 [ACS].

* Corresponding author in 95% articles.

- (143) Sharma, S. and **Jana, A. K.** (2025). “A Comparative Study on Four Thermodynamic Frameworks of Clathrate Phase: Predicting Three Phase Hydrate Equilibrium,” *Industrial & Engineering Chemistry Research (In Press)* [ACS].
- (142) Mukherjee, R. and **Jana, A. K.** (2025). “Novel Decarbonized Desalination System: Technoeconomic–Environmental Feasibility with Optimal Designing,” *Industrial & Engineering Chemistry Research*, 64, 11497 – 11514 [ACS].
- (141) Nande, P. S. and **Jana, A. K.** (2025). “Dynamics and Global Optimization of an Integrated PEM Fuel Cell Unit: Cost, Efficiency and Power Generation Perspective,” *Chemical Engineering Research and Design*, 217, 342 – 360 [Elsevier].
- (140) Nande, P. S. and **Jana, A. K.** (2025). “Fundamental Modeling of a PEM Fuel Cell Integrated System: Experimental Validation and Multi-Objective Optimization,” *Energy & Fuels*, 39, 2230-2248 [ACS].
- (139) Patel, G. S. and **Jana, A. K.** (2025). “Predicting Three Phase (Hydrate-Liquid-Vapour) Equilibria of Mixed Hydrates in Guest Gas Swapping: AI-based Approach versus Physical Modeling,” *Canadian Journal of Chemical Engineering*, 103, 1433-1449 [Wiley].
- (138) Mukherjee, R., **Jana, A. K.**, Mondal, B. (2024). “Solar Thermal-Based Sustainable Desalination Technology: Validation and Optimal Process Configuration,” *ACS ES&T Water*, 4, 5013-5026 [ACS].
- (137) Thakran, R., Mondal, B., **Jana, A. K.** (2024). “Decarbonized Thermal Vapor Compressor-based Solar Desalinator: Evaluating Yield and Economy over Plant Scenario,” *Industrial & Engineering Chemistry Research*, 63, 19091-19105 [ACS].
- (136) Sharma, S., Dongre, J. H., **Jana, A. K.** (2024). “Gas Hydrate Dynamics with Parameter-Free Clathrate Phase Description: Validation for Hydrate Formation and Dissociation,” *The Journal of Physical Chemistry A*, 128, 7966-7981 [ACS].
- (135) Mukherjee, R. and **Jana, A. K.** (2024). “Solar-Driven Thermal and Mechanical Vapor Compressor Integrated Desalination System: Zero Emission, High Yield and Cost Reduction,” *ACS Sustainable Chemistry & Engineering*, 12, 9180-9192 [ACS].

- (134) Patel, G. S. and **Jana, A. K.** (2024). “Machine Learning based Prediction of Gas Hydrate Dynamics: A Comparison with a Fundamental Model against Experimental Data,” *Energy & Fuels*, 38, 16272-16285 [ACS].
- (133) Lalam, S., **Jana, A. K.**, Dwarapudi, S. (2024). “Formulating Iron Ore Pellet Induration Process in an Industrial Straight Grate System: Real-time Experimentation and Validation,” *Thermal Science and Engineering Progress* (In Press, DOI: 10.1016/j.tsep.2024.102928) [Elsevier].
- (132) Lalam, S., **Jana, A. K.**, Dwarapudi, S. (2024). “Physics-Inspired AI-Based Model for Cold Crushing Strength of an Iron Ore Pellet Plant,” *Canadian Metallurgical Quarterly* (In Press, DOI: 10.1080/00084433.2024.2395616) [Taylor & Francis].
- (131) Sharma, S. and **Jana, A. K.** (2024). “A Deparameterized Clathrate Phase Description using Crystallography Theory: Validating Guest Swapping Dynamics in Gas Hydrate,” *Energy & Fuels*, 38, 11717 – 11732 [ACS].
- (130) Mukherjee, R., Mondal, B., **Jana, A. K.** (2024). “A Carbon-Neutral Highly Productive Solar-Powered Desalination Process: Improving Economic Performance with Carbon Pricing,” *Industrial & Engineering Chemistry Research*, 63, 9107 – 9123 [ACS].
- (129) Sharma, S. and **Jana, A. K.** (2024). “An Optimal Approach of Pure/Mixed CO₂ Sequestration with Producing Hydrated Natural Gas: Physical Insights and Validation,” *Journal of Industrial and Engineering Chemistry*, 138, 611 – 622 [Elsevier].
- (128) Mukherjee, R., Ritambra, S., **Jana, A. K.** (2024). “Dynamic Optimization of Multi-Effect Seawater Distillation to Gain Insights into Various Feeding Patterns: Productivity, Thermodynamic, Economic, and Environmental Perspective,” *Industrial & Engineering Chemistry Research*, 63, 3163–3178 [ACS].
- (127) Dhamu, V., Mengqi, X., Qureshi, M. F., Yin, Z., **Jana, A. K.**, Linga, P. (2024). “Evaluating CO₂ Hydrate Kinetics in Multi-Layered Sediments using Experimental and Machine Learning Approach: Applicable to CO₂ Sequestration,” *Energy* (In Press, DOI: 10.1016/j.energy.2023.129947) [Elsevier].

- (126) Parhi, S. S., Rangaiah, G. P., **Jana, A. K.** (2024). “A Novel Vapor Recompressed Batch Extractive Distillation for Ethanol Dehydration,” *Computer Aided Chemical Engineering*, 53, 2347 - 2352 [**Elsevier**].
- (125) Dongre, J. H. and **Jana, A. K.** (2023). “Proposing Crystallographic Theory to Deparameterize Hydrate Phase Description: Physical Insights and Validation,” *Industrial & Engineering Chemistry Research*, 62, 22081-22092 [**ACS**].
- (124) Mondal, B., Kapadiya, P., **Jana, A. K.** (2023). “A Zero Discharge, Carbon-Neutral Bi-Fuel Production Process that Yields Algal Biodiesel and Renewable Hydrogen,” *Journal of Cleaner Production (In Press, DOI: 10.1016/j.jclepro.2023.138865)* [**Elsevier**].
- (123) Sharma, S. and **Jana, A. K.** (2023). “Swapping of Hydrated Natural Gas with CO₂/N₂ Guest: Physical Modeling, Validation and Genetic Algorithm based Optimization,” *Industrial & Engineering Chemistry Research*, 62, 13201-13212 [**ACS**].
- (122) Mondal, B. and **Jana, A. K.** (2023). “A Novel Solar Reactive Distillation based Production of Algal Biodiesel: Retrofitting, Carbon Cost and Process Economics,” *Chemical Engineering and Processing - Process Intensification (In Press, DOI: 10.1016/j.cep.2023.109517)* [**Elsevier**].
- (121) Dongre, J. H. and **Jana, A. K.** (2023). “Formulating Noncovalent Interactions for Gas Hydrates with Electrolytes: A New Approach of Stability Analysis,” *Industrial & Engineering Chemistry Research*, 62, 12365-12380 [**ACS**].
- (120) Sharma, S. and **Jana, A. K.** (2023). “Modeling Gas Hydrate Dynamics: Experimental Validation and Evolutionary Algorithm-Based Optimization,” *Energy and Fuels*, 37, 10567-10584 [**ACS**].
- (119) Patankar, S. M., Palodkar, A. V., **Jana, A. K.** (2022). “Novel Thermokinetic Model for Gas Hydrates: Experimental Validation at Diverse Geological Conditions,” *Industrial & Engineering Chemistry Research*, 61, 18282–18296 [**ACS**].
- (118) Dongre, J. H., Deshmukh, A., **Jana, A. K.** (2022). “A Thermodynamic Framework to Identify Apposite Refrigerant Former for Hydrate-Based Applications,” *Scientific Reports (In Press, DOI: 10.1038/s41598-022-19557-y)* [**Nature Group**].

- (117) Palodkar, A. V., Dongre, J. H., Thakre, N., **Jana, A. K.** (2022). “Microsecond Molecular Dynamics of Methane – Carbon Dioxide Swapping in Pure and Saline Water Environment,” *Scientific Reports* 12, 2634 (DOI: 10.1038/s41598-022-06583-z), pp. 1-16 [**Nature Group**].
- (116) Thakre, N. and **Jana, A. K.** (2022). “Predicting Phase Equilibrium of Pure and Mixed Refrigerant Gas Hydrates: ab initio Assisted Lattice Distortion Theory,” *AIChE Journal* (**In Press, DOI: DOI:10.1002/aic.17463**) [**Wiley**].
- (115) Dongre, J. H. and **Jana, A. K.** (2022). “Formulating Noncovalent Interactions to Predict Structural Transition in Mixed Guest Hydrates,” *AIChE Journal* (**In Press, DOI: 10.1002/aic.17670**) [**Wiley**].
- (114) Pandit, S. R. and **Jana, A. K.** (2022). “Transforming Conventional Distillation Sequence to Dividing Wall Column: Minimizing Cost, Energy Usage and Environmental Impact through Genetic Algorithm,” *Separation and Purification Technology* (**In Press, DOI: 10.1016/j.seppur.2022.121437**) [**Elsevier**].
- (113) Mondal, B. and **Jana, A. K.** (2022). “Optimal Reflux Splitting Reactive Distillation for Algal Biodiesel Production: Waste Heat Recovery through Vapor Recompression and Organic Rankine Cycle,” *Separation and Purification Technology* (**In Press, DOI: 10.1016/j.seppur.2022.121007**) [**Elsevier**].
- (112) **Jana, A. K.** (2022). “Vertical Partition in Fractionating Tower to Configure a Novel Heat Integrated Distillation Hybridized with Vapor Recompression,” *Separation and Purification Technology* (**In Press, DOI: 10.1016/j.seppur.2019.116153**) [**Elsevier**].
- (111) Thakre, N. and **Jana, A. K.** (2022). “Physical and Molecular Insights to Clathrate Hydrate Thermodynamics,” *Renewable & Sustainable Energy Reviews* (**In Press, DOI: 10.1016/j.rser.2020.110150**) [**Elsevier**].
- (110) Palodkar, A. V. and **Jana, A. K.** (2022). “Gas Hydrate Dynamics in Distributed Porous Particles with Saltwater: Model Formulation and Experimental Validation,” *Chemical Engineering Journal* (**In Press, DOI: 10.1016/j.cej.2019.123660**) [**Elsevier**].

- (109) Palodkar, A. V. and **Jana, A. K.** (2022). "Clathrate Hydrate Dynamics with Synthetic- and Bio-Surfactant in Porous Media: Model Formulation and Validation," *Chemical Engineering Science* (**In Press, DOI:** 10.1016/j.ces.2019.115386) [**Elsevier**].
- (108) Mondal, B., Parhi, S. S., Rangaiah, G. P. and **Jana, A. K.** (2022). "Nano-Catalytic Heterogeneous Reactive Distillation for Algal Biodiesel Production: Multi-Objective Optimization and Heat Integration," *Energy Conversion and Management* (**In Press, DOI:** /10.1016/j.enconman.2021.114298) [**Elsevier**].
- (107) Dhamu, V., Thakre, N., **Jana, A. K.** (2022). "Structure-H Hydrate of Mixed Gases: Phase Equilibrium Modeling and Experimental Validation," *Journal of Molecular Liquids* (**In Press, DOI:** 10.1016/j.molliq.2021.117605) [**Elsevier**].
- (106) Parhi, S. S., Rangaiah, G. P. and **Jana, A. K.** (2022). "A Novel Vapor Recompressed Batch Extractive Distillation: Design and Retrofitting," *Separation and Purification Technology* (**In Press, DOI:** 10.1016/j.seppur.2020.118225) [**Elsevier**].
- (105) Dongre, J. H. and **Jana, A. K.** (2022). "Insight into the Thermo-Physics of Hydrate Lattice: Three Phase Equilibrium in Presence of Electrolyte," *The Journal of Chemical Thermodynamics* (**In Press, DOI:** 10.1016/j.jct.2020.106182) [**Elsevier**].
- (104) **Jana, A. K.** (2022). "An Internal Thermal Integration Arrangement for Multicomponent Batch Rectifier: Introducing Vapor Recompression Mechanism," *Chemical Engineering Processing: Process Intensification* (**In Press, DOI:** 10.1016/j.cep.2021.108771) [**Elsevier**].
- (103) Mondal, B., Rangaiah, G. P. and **Jana, A. K.** (2022). "Optimizing Algal Biodiesel Production from a Novel Reactive Distillation based Unit: Reducing CO₂ Emission and Cost," *Chemical Engineering Processing: Process Intensification* (**In Press, DOI:** 10.1016/j.cep.2022.108948) [**Elsevier**].
- (102) Chatterjee, A., **Jana, A. K.**, Basu, J. K. (2022). "Silica Supported Binary Metal Organic Framework for Removing Organic Dye Involving Combined Effect of Adsorption Followed by Photocatalytic Degradation," *Materials Research Bulletin* (**In Press, DOI:** 10.1016/j.materresbull.2021.111227) [**Elsevier**].

- (101) Chatterjee, A., **Jana, A. K.**, Basu, J. K. (2021). “A Binary MOF of Iron and Copper for Treating Ciprofloxacin-Contaminated Waste Water by an Integrated Technique of Adsorption and Photocatalytic Degradation,” *New Journal of Chemistry*, 45, 17196 - 17210 [RSC].
- (100) Sankar, K. and **Jana, A. K.** (2021). “Nonlinear Control of a PEM Fuel Cell Integrated System with Water Electrolyzer,” *Chemical Engineering Research and Design*, 171, 150 – 167 [Elsevier].
- (99) Palodkar, A. V. and **Jana, A. K.** (2021). “Naturally Occurring Hydrate Formation and Dissociation in Marine Sediment: Experimental Validation,” *Industrial & Engineering Chemistry Research*, 60, 1175 – 1184 [ACS].
- (98) Sankar, K., Saravanakumar, G and **Jana, A. K.** (2021). “Nonlinear Multivariable Control of an Integrated PEM Fuel Cell System with a DC – DC Boost Converter,” *Chemical Engineering Research and Design*, 167, 141 – 156 [Elsevier].
- (97) Thakre, N. and **Jana, A. K.** (2020). “A Lattice Distortion Theory for Promoter Containing Clathrate Hydrates,” *Scientific Reports* 10, 9622 (DOI: 10.1038/s41598-020-66776-2), pp. 1-15 [Nature Group].
- (96) Thakre, N. and **Jana, A. K.** (2020). “Nonmonotonous Lattice Distortion Model for Gas Hydrates,” *The Journal of Physical Chemistry A*, 124, 3149 – 3156 [ACS].
- (95) Thakre, N., Palodkar, A. V., Dongre, J. H., **Jana, A. K.** (2020). “Microscopic Molecular Insights into Hydrate Formation and Growth in Pure and Saline Water Environments,” *The Journal of Physical Chemistry A*, 124, 4241 – 4252 [ACS].
- (94) Chatterjee, A., **Jana, A. K.**, Basu, J. K. (2020). “A Novel Synthesis of MIL-53 (Al)@SiO₂: An Integrated Photocatalyst Adsorbent to Remove Bisphenol A from Wastewater,” *New Journal of Chemistry*, 44, 18892 – 18905 [RSC].
- (93) Dongre, J. H., Thakre, N., Palodkar, A. V., **Jana, A. K.** (2020). “Carbon Dioxide Hydrate Growth Dynamics and Crystallography in Pure and Saline Water,” *Crystal Growth and Design*, 20, 7129 – 7140 [ACS].

- (92) Wang Z., Parhi, S. S., Rangaiah, G. P. and **Jana, A. K.** (2020). "Analysis of Weighting and Selection Methods for Pareto-Optimal Solutions of Multiobjective Optimization in Chemical Engineering Applications," *Industrial & Engineering Chemistry Research*, 59, 14850 – 14867 [ACS].
- (91) Chatterjee, A., Shamim, S., **Jana, A. K.**, Basu, J. K. (2020). "Insights into the Competitive Adsorption of Pollutants on a Mesoporous Alumina–Silica Nano-Sorbent Synthesized from Coal Fly Ash and a Waste Aluminium Foil," *RSC Advances*, 10, 15514 – 15522 [RSC].
- (90) Parhi, S. S., Pramanik, A., Rangaiah, G. P., **Jana, A. K.** (2020). "Evolutionary Algorithm based Multiobjective Optimization of Vapor Recompressed Batch Extractive Distillation: Assessing Economic Potential and Environmental Impact," *Industrial & Engineering Chemistry Research*, 59, 5032 – 5046 [ACS].
- (89) Parhi, S. S., Rangaiah, G. P. and **Jana, A. K.** (2020). "Mixed-Integer Dynamic Optimization of Conventional and Vapor Recompressed Batch Distillation for Economic and Environmental Objectives," *Chemical Engineering Research and Design*, 154, 70-85 [Elsevier].
- (88) Mandal, S. and **Jana, A. K.** (2020). "Simulating Reactive Distillation of HIx (HI-H₂O-I₂) System in Sulphur-Iodine Cycle for Hydrogen Production," *Nuclear Engineering and Technology*, 52, 279-286 [Elsevier].
- (87) Srinivas, P. S., Mishra, D. K., Kulkarni, A. K., Gupta, R., Korath, J. M., **Jana, A. K.** (2020). "Investigation of Vortex Flow Patterns at the Meniscus in a Water Caster Mould", *Canadian Metallurgical Quarterly*, 59, 211 – 232 [Taylor & Francis].
- (86) Srinivas, P. S., Korath, J. M., **Jana, A. K.** (2020). "Multiphase Vortex Flow Patterns in Slab Caster Mould: Insights of Air Vortex Interaction and Plant Data Analysis," *Canadian Metallurgical Quarterly*, 59, 270 – 287 [Taylor & Francis].
- (85) Palodkar, A. V. and **Jana, A. K.** (2019). "Modeling Recovery of Natural Gas from Hydrate Reservoirs with Carbon Dioxide Sequestration: Validation with Iğnik Sikumi Field

- Data,” *Scientific Reports*, 9, 18901 (DOI: 10.1038/s41598-019-55476-1), pp. 1-14 [Nature Group].
- (84) Chatterjee, A., Basu, J. K., **Jana, A. K.** (2019). “Alumina-Silica Nano-Sorbent from Plant Fly Ash and Scrap Aluminium Foil in Removing Nickel through Adsorption,” *Powder Technology*, 354, 792-803 [Elsevier].
- (83) Mondal, B. and **Jana, A. K.** (2019). “Techno-Economic Feasibility of Reactive Distillation for Biodiesel Production from Algal Oil: Comparing with a Conventional Multiunit System,” *Industrial & Engineering Chemistry Research*, 58, 12028 – 12040 [ACS].
- (82) Aurangzeb, Md. and **Jana, A. K.** (2019). “A Novel Heat Integrated Extractive Dividing Wall Column for Ethanol Dehydration,” *Industrial & Engineering Chemistry Research*, 58, 9109 – 9117 [ACS].
- (81) Parhi, S. S., Rangaiah, G. P. and **Jana, A. K.** (2019). “Vapor Recompressed Batch Distillation: Optimizing Reflux Ratio at Variable Mode,” *Computers and Chemical Engineering*, 124, 184 – 196 [Elsevier].
- (80) Aurangzeb, Md. and **Jana, A. K.** (2019). “Double-Partitioned Dividing Wall Column for a Multicomponent Azeotropic System,” *Separation and Purification Technology*, 219, 33 – 46 [Elsevier].
- (79) Srinivas, P. S., Mishra, D. K., Gupta, R., Korath, J. M., **Jana, A. K.** (2019). “Vortex Characteristics due to Nozzle Clogging in Water Caster Mould: Modelling and Validation,” *Canadian Metallurgical Quarterly*, 58, 308 – 324 [Taylor & Francis].
- (78) Parhi, S. S., Rangaiah, G. P., **Jana, A. K.** (2019). “Multi-Objective Optimization of Vapor Recompressed Distillation Column in Batch Processing: Improving Energy and Cost Savings,” *Applied Thermal Engineering*, 150, 1273 – 1296 [Elsevier].
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- (76) Palodkar, A. V. and **Jana, A. K.** (2019). “Growth and Decomposition Mechanism of Clathrate Hydrates in the Presence of Porous Media and Seawater: Experimental Validation,” *Energy & Fuels*, 33, 1433 – 1443 [ACS].
- (75) Thakre, N. and **Jana, A. K.** (2019). “Computing Anisotropic Cavity Potential for Clathrate Hydrates,” *The Journal of Physical Chemistry A*, 123, 2762 – 2770 [ACS].
- (74) Sankar, K., Aguan, K., **Jana, A. K.** (2019). “A Proton Exchange Membrane Fuel Cell with an Airflow Cooling System: Dynamics, Validation and Nonlinear Control,” *Energy Conversion and Management*, 183, 230 – 240 [Elsevier].
- (73) Aurangzeb, Md. and **Jana, A. K.** (2019). “Vapor Recompression with Interboiler in a Ternary Dividing Wall Column: Improving Energy Efficiency and Saving, and Economic Performance,” *Applied Thermal Engineering*, 147, 1009 – 1023 [Elsevier].
- (72) **Jana, A. K.** (2019). “Performance Analysis of a Heat Integrated Column with Heat Pumping,” *Separation and Purification Technology*, 209, 18 – 25 [Elsevier].
- (71) Palodkar, A. V. and **Jana, A. K.** (2018). “Fundamental of Swapping Phenomena in Naturally Occurring Gas Hydrates,” *Scientific Reports* 8, 16563 (DOI: 10.1038/s41598-018-34926-2), pp. 1 – 10 [Nature Group].
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- (69) **Jana, A. K.** (2018). “A Novel Divided-Wall Heat Integrated Distillation Column: Thermodynamic and Economic Feasibility,” *Industrial & Engineering Chemistry Research*, 57, 12127 – 12135 [ACS].
- (68) Sankar, K. and **Jana, A. K.** (2018). “Dynamics and Estimator-based Nonlinear Control of a PEM Fuel Cell,” *IEEE Transactions on Control Systems Technology*, 26, 1124 – 1131 [IEEE].
- (67) **Jana, A. K.** and Banerjee, S. (2018). “Neuro Estimator-based Inferential Extended Generic Model Control of a Reactive Distillation Column,” *Chemical Engineering Research and Design*, 130, 284-294 [Elsevier].

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- (65) Banerjee, S. and **Jana, A. K.** (2018). “Observer-based Extended Generic Model Control of a Reactive Batch Distillation,” *Chemical Engineering Science*, 179, 185-197 [Elsevier].
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- (62) Banerjee, S. and **Jana, A. K.** (2017). “Internally Heat Integrated Batch Distillation: Vapor Recompression and Nonlinear Control,” *Separation and Purification Technology*, 189, 267 – 278 [Elsevier].
- (61) Sankar, K., Thakre, N., Singh, S. M., **Jana, A. K.** (2017). “Sliding Mode Observer based Nonlinear Control of a PEMFC Integrated with a Methanol Reformer,” *Energy*, 139, 1126 – 1143 [Elsevier].
- (60) **Jana, A. K.** (2017). “An Energy Efficient Middle Vessel Batch Distillation: Techno-Economic Feasibility, Dynamics and Control,” *Applied Thermal Engineering*, 123, 411 - 421 [Elsevier].
- (59) Srinivas, P. S., Singh, A., Korath, J. M., **Jana, A. K.** (2017). “Multiphase Vortex Flow Patterns in Slab Caster Mold: Experimental Study,” *ISIJ International*, 9, 1553 – 1562 [The Iron and Steel Institute of Japan].
- (58) **Jana, A. K.** (2017). “A Thermally Coupled Dividing Tower Batch Rectifier: Energy Consumption and Cost,” *Applied Thermal Engineering*, 119, 610 – 616 [Elsevier].

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- (3) **Jana, A. K.**, Samanta, A. N. and Ganguly, S. (2005). “Globally Linearized Control on Diabatic Continuous Stirred Tank Reactor: A Case Study,” *ISA Transactions*, 44, 423-444 [**Elsevier**].
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Sponsored Projects and Industrial Consultancy

Ongoing

10. Title: Control Algorithm for High Power PEM Fuel Cell Systems

Sponsor: Indian Space Research Organization (ISRO), Govt. of India

Duration: January 2023 – December 2025

Principal Investigator: Amiya K. Jana

9. Title: Theoretical and Experimental Study on Advancing Real-Time Multi-Effect Distillation for Desalination: Solar-Thermal Power Driven Energy Management, Optimization, AI based Soft Sensing and Nonlinear Control

Sponsor: Department of Science and Technology (DST), Govt. of India

Duration: March 2023 – March 2026

Principal Investigator: Amiya K. Jana

8. Title: Techno-Economic Feasibility of Hydrate based Desalination using LNG Cold Energy through Thermal Integration Route

Sponsor: Council of Scientific and Industrial Research (CSIR), Govt. of India

Duration: Sep 2023 – Sep 2026

Principal Investigator: Amiya K. Jana

Completed

7. Title: Nonlinear State Estimation and Control of a Heterogeneously Catalyzed Reactor

Sponsor: ISIRD, IIT Kharagpur

Duration: January 2008 – January 2011

Principal Investigator: Amiya K. Jana

6. Title: Design, Analysis and Control of Internally Heat Integrated Distillation Columns

Sponsor: Department of Science and Technology (DST), Govt. of India

Duration: October 2009 – October 2012

Principal Investigator: Amiya K. Jana

5. Title: Design, Modeling and Control of a High Pressure Pilot Scale HIX Reactive Distillation

Sponsor: Department of Atomic Energy (DAE), BARC, Govt. of India

Duration: February 2010 – March 2013

Principal Investigator: Amiya K. Jana

4. Title: Modeling, Analysis and Control of Reactive Distillation Columns

Sponsor: Council of Scientific and Industrial Research (CSIR), Govt. of India

Duration: May 2010 – March 2014

Principal Investigator: Amiya K. Jana

3. Title: Virtual Lab on Chemical Process Dynamics

Sponsor: Ministry of Human Resource and Development (MHRD), Govt. of India

Duration: June 2010 – December 2018

Principal Investigator: Amiya K. Jana

2. Title: Economic Feasibility of a Novel Thermally Integrated Batch Distillation to Reduce Energy use

Sponsor: Council of Scientific and Industrial Research (CSIR), Govt. of India

Duration: Jan 2016 – March 2021

Principal Investigator: Amiya K. Jana

1. Title: Improvement of Benzyle Alcohol Production Process

Sponsor: LANXESS India Private Ltd.

Duration: December 2019 – December 2020

Co- Principal Investigator: Amiya K. Jana

Research Supervision

◆ PhD Completed	15 (10 single-guidance)
◆ PhD Awarded	14 (9 single-guidance)
◆ PhD in Progress	9 (5 single-guidance)
◆ MTech Awarded	75
◆ MTech in Progress	4 (2025-26)

Professional Affiliations

- ◆ Member of Institution of Chemical Engineers (UK): 100122944
- ◆ Member of Royal Society of Chemistry (London, UK): 754891
- ◆ Life Member of Indian Institute of Chemical Engineers (IChE): LM 32584
- ◆ Life Member of Indian Society for Technical Education (ISTE): LM 64643
- ◆ Member of Breakthrough Science Society

Research Areas

- ◆ Process System Engineering
 - Process control
 - Modeling and simulation
 - Process optimization
 - Artificial intelligence
 - Process intensification
- ◆ Sustainable Energy Engineering
 - Decarbonization
 - Solar thermal technology
 - Green hydrogen
 - Biodiesel
 - Fuel cell
 - Life cycle assessment
- ◆ Clean Fuel
 - Gas hydrates
 - Carbon capture, sequestration and swapping
- ◆ Water
 - Desalination
 - Wastewater treatment

Courses Taught

- ◆ Instrumentation and process control (UG level) [**developed video lecture under NPTEL**]
- ◆ Process dynamics and control (PG level)
- ◆ Process modeling and simulation (PG level)
- ◆ Computer aided process engineering (UG level)
- ◆ Advanced heat transfer (PG level)
- ◆ Mass transfer (UG level)
- ◆ Thermodynamics (UG level)
- ◆ Computer methods in chemical engineering (UG level)

Administrative Positions Held

- ◆ Honorary Secretary (2021–till date): Indian Institute of Chemical Engineers – Kharagpur Regional Centre (IIChE–KRC)
- ◆ Time-Table In-charge (2025–till date): Chemical Engineering Department, IIT Kharagpur
- ◆ Time-Table In-charge (2021–2024): Chemical Engineering Department, IIT Kharagpur
- ◆ Time-Table In-charge (2018–2020): Chemical Engineering Department, IIT Kharagpur
- ◆ Member, New UG Curriculum Committee (2020): Chemical Engineering Department, IIT Kharagpur
- ◆ Faculty Advisor (2015–2020): Chemical Engineering Department, IIT Kharagpur
- ◆ Faculty Advisor (2009–2014): Chemical Engineering Department, IIT Kharagpur
- ◆ Honorary Secretary (2008–2010): Purchase Committee, Chemical Engineering Department, IIT Kharagpur
- ◆ Honorary Treasurer (2007–2008): Indian Institute of Chemical Engineers – Kharagpur Regional Centre (IIChE–KRC)

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