

CURRICULUM VITAE



Dr. RAHUL KUMAR

Associate Professor, Department of
Chemical Engineering, University of
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Research Interest:

**Antisolvent crystallization, Solubility
measurement, Supercritical CO₂ based
Extraction, Spray drying**

CAREER OBJECTIVE

To utilize the abilities developed during my education and professional experience for promoting the industrial and educational development of the nation.

EDUCATION

Qualification	University	Institute	Year	CPI/%
Ph.D	JUET Guna	JUET Guna	2017	
M. Tech	IIT Bombay	IIT Bombay	2009	7.57
B. Tech	UPTU Lucknow	BIET Jhansi	2007	70.14

SCHOLASTIC ACHIEVEMENTS

Secured **All India Rank (AIR) -38** in GATE-2006 in Chemical Engineering

TEACHING EXPERIENCE

Total experience is 14y-11m-18d, of which post-PhD experience is 6y-3m -6d (as on 30-08-2023)

Designation	Time	Organization
Assistant Professor (G-I)	13 July 2009 – 30 June 2011	Jaypee University of Engineering and Technology, Guna, Madhya Pradesh

Assistant Professor (G-II)	01 July 2011 – 30 July 2013	Jaypee University of Engineering and Technology, Guna, Madhya Pradesh
Assistant Professor (G-II)	1 August – 31 December 2017	University of Petroleum and Energy Studies, Dehradun, Uttarakhand
Assistant Professor (G-III)	1 Jan 2018 – 28 Feb 2022	University of Petroleum and Energy Studies, Dehradun, Uttarakhand
Associate Professor	1 March 2022 - present	University of Petroleum and Energy Studies, Dehradun, Uttarakhand

PUBLICATIONS (SCI/Scopus Indexed)

1	Kumar, R. , Thakur, A. K., Kali, G., Pitchaiah, K. C., Arya, R. K., & Kulabhi, A. (2023). Particle preparation of pharmaceutical compounds using supercritical antisolvent process: current status and future perspectives. <i>Drug Delivery and Translational Research</i> , 13(4), 946-965. (Cite Score = 9.8)
2	Kumar, R. , Thakur, A. K., Kulabhi, A., & Mishra, A. (2023). Solubility Prediction of Lornoxicam in Different Pure Solvents Using Semi-Empirical Correlations and Thermodynamic Models. <i>International Journal of Thermodynamics</i> , 26(1), 12-16. (Cite Score = 1.3)
3	Kumar, R. , Thakur, A. K., Banerjee, N., Kumar, A., Gaurav, G. K., & Arya, R. K. (2023). Liquid antisolvent crystallization of pharmaceutical compounds: current status and future perspectives. <i>Drug Delivery and Translational Research</i> , 13(2), 400-418. (Cite Score = 9.8)
4	Thakur, A. K., Kumar, R. , Kumar, A., Shankar, R., Khan, N. A., Gupta, K. N., & Arya, R. K. (2023). Pharmaceutical waste-water treatment via advanced oxidation based integrated processes: An engineering and economic perspective. <i>Journal of Water Process Engineering</i> , 54, 103977. (Cite Score = 9.7)
5	Thakur, A. K., Kumar, R. , Shukla, P., Sharma, P., & Kulabhi, A. (2023). Biochar from agricultural biomass: Current status and future scope. <i>Materials Today: Proceedings</i> (In Press) (Cite Score = 3.2)
6	Gupta, K. N., Kumar, R. , Thakur, A. K., & Khan, N. A. (2023). Treatment of Dyeing Wastewater Using Foam Separation: Optimization Studies. <i>Water</i> , 15(12), 2236. (Cite Score = 5.5)
7	Pati, S., Arya, R. K., Kumar, R. , & Verma, O. P. (2023). Energy optimization and neural-based dynamic analysis of integrated multiple stage evaporator. <i>International Journal of Chemical Reactor Engineering</i> (In Press). (Cite Score = 2.8)
8	Arya, R. K., Thapliyal, D., Thakur, A. K., Kumar, R. , & Verros, G. D. (2023). On the extremum dissipation for steady state incompressible flow past a sphere at low Reynolds number. <i>International Journal of Chemical Reactor Engineering</i> (In Press). (Cite Score

	= 2.8)
9	Thakur, A. K., Kumar, R. , Banerjee, N., Chaudhari, P., & Kumar, A. (2022). Simulation of ethylene polymerization in continuous slurry reactors. <i>Materials Today: Proceedings</i> , 57, 1462-1467. (Cite Score = 3.2)
10	Kumar, R. (2022). Understanding particle formation in a moving droplet using the classical theory of nucleation and diffusion-based growth mechanism: A modeling approach. <i>Materials Today: Proceedings</i> , 57, 1437-1441. (Cite Score = 3.2)
11	Chaudhari, P., Thakur, A. K., Kumar, R. , Banerjee, N., & Kumar, A. (2022). Comparison of NSGA-III with NSGA-II for multi objective optimization of adiabatic styrene reactor. <i>Materials Today: Proceedings</i> , 57, 1509-1514. (Cite Score = 3.2)
12	Banerjee, N., Sukichandran, P., Chaudhari, P., Thakur, A. K., & Kumar, R. (2022). Energy analysis and feasibility studies for algal biomass and biofuels. <i>Materials Today: Proceedings</i> , 57, 1448-1454. (Cite Score = 3.2)
13	Thakur, A. K., Kumar, R. , Banerjee, N., Chaudhari, P., & Gaurav, G. K. (2022). Hydrodynamic modeling of liquid-solid flow in polyolefin slurry reactors using CFD techniques—A critical analysis. <i>Powder Technology</i> , 405, 117544. (Cite Score = 9.4)
14	Thakur, A. K., Kumar, R. , Kumar, V. V., Kumar, A., Gaurav, G. K., & Gupta, K. N. (2022). A critical review on thermodynamic and hydrodynamic modeling and simulation of liquid antisolvent crystallization of pharmaceutical compounds. <i>Journal of Molecular Liquids</i> , 362, 119663. (Cite Score = 9.7)
15	Kumar, A., Thakur, A. K., Kumar, R. , Chaudhari, P., Aurangzeb, M. D., & Gaurav, G. K. (2022). Experimental investigation on in-situ void fraction of air-water co-current flow-through milli-channels. <i>Materials Today: Proceedings</i> , 57, 1671-1676. (Cite Score = 3.2)
16	Arya, R. K., Thapliyal, D., Verros, G. D., Singh, N., Singh, D., Kumar, R. , Srivastava, R. K., & Tiwari, A. K. (2022). On the Validity of a Linearity Axiom in Diffusion and Heat Transfer. <i>Coatings</i> , 12(10), 1582. (Cite Score= 4.7)
17	Kumar, R. , Rawat, D. S., Thakur, A. K., Chaudhari, P., & Banerjee, N. (2022). Experimental measurement and thermodynamic modeling of solubility of flufenamic acid in different pure solvents. <i>Materials Today: Proceedings</i> , 57, 1489-1493 (Cite Score = 3.2)
18	Gaurav, G. K., Kumar, A., Thakur, A. K., & Kumar, R. (2022). Sensor Methods for the Detection of Polycyclic Aromatic Hydrocarbons (PAHs) in Industrial Wastewater. <i>Journal of Nano-and Electronic Physics</i> , 14(6). (Cite Score = 1.2)
19	Kumar, R. (2022). Numerical simulation to estimate the droplet size in aerosol solvent extraction system. <i>Materials Today: Proceedings</i> , 57, 1515-1519. (Cite Score = 3.2)
20	Kumar, R. , Thakur, A. K., Banerjee, N., & Chaudhari, P. (2021). A critical review on the particle generation and other applications of rapid expansion of supercritical solution. <i>International Journal of Pharmaceutics</i> , 608, 121089. (Cite Score = 10.5)
21	Thakur, A. K., Gupta, S. K., Kumar, R. , Banerjee, N., & Chaudhari, P. (2021). Multi-objective optimization of an industrial slurry phase ethylene polymerization reactor. <i>International Journal of Chemical Reactor Engineering</i> , 20(6), 649-659. (Cite Score = 2.8)
22	Kumar, R. , Thakur, A. K., Chaudhari, P., & Banerjee, N. (2021). Particle size reduction techniques of pharmaceutical compounds for the enhancement of their dissolution rate and bioavailability. <i>Journal of Pharmaceutical Innovation</i> , 1-20. (Cite Score = 3.7)
23	Kumar, R. , Thakur, A. K., Banerjee, N., & Chaudhari, P. (2021). Investigation on

	crystallization phenomena with supercritical carbon dioxide (CO ₂) as the antisolvent. <i>International Journal of Chemical Reactor Engineering</i> , 19(8), 861-871. (Cite Score = 2.8)
24	Kumar, R. , Kumar, S., Chaudhari, P., & Thakur, A. K. (2021). Liquid antisolvent recrystallization and solid dispersion of flufenamic acid with polyvinylpyrrolidone K-30. <i>International Journal of Chemical Reactor Engineering</i> , 19(7), 663-671. (Cite Score = 2.8)
25	Gupta, K. N., & Kumar, R. (2020). Kinetic modeling and optimization of fraction of bed utilized for the gaseous phase removal of toluene in fixed bed adsorption column: Response surface methodology. <i>Separation Science and Technology</i> , 55(6), 1062-1077. (Cite Score = 5.3)
26	Gupta, K. N., & Kumar, R. (2020). Fixed bed utilization for the isolation of xylene vapor: Kinetics and optimization using response surface methodology and artificial neural network. <i>Environmental Engineering Research</i> , 26(2), 200105 (Cite Score = 6.6)

BOOK CHAPTER

Thakur, A. K., Kumar, R., Chaudhari, P., & Shankar, R. (2021). Removal of heavy metals using bentonite clay and inorganic coagulants. *Removal of Emerging Contaminants Through Microbial Processes*, 47-69.

CONFERENCE PAPERS

1	Aadithyan R, Jabez Kshitiz Prakash, Adarsh Murali Sujatha, Rahul Kumar “Liquid Antisolvent Crystallization: Applications and Challenges” <i>In Proceedings of International Conference on Energy Sustainability and Advanced Materials</i> , Nov 23-24, 2022
2	R Shruti Krishna, K C Pitchaiah, Rahul Kumar, C V S Brahmmananda Rao, N. Sivaraman, “Solubilities Studies on Camphor-10-Sulfonic Acid in Supercritical Carbon dioxide Medium”. <i>Emerging Trends in Separation Science and Technology</i> , Nov 22-26, 2022
3	Anurag Kulabhi, Pranav Shukla, Purusharth Sharma, Amit K. Thakur, Rahul Kumar, “Recent advances in Pharmaceutical degradation using Fenton oxidation”, <i>Energy Conclave</i> , August 23-24, 2022
4	Tang, L., Patel, A., Sweeney, D. J., Banerjee, N., Thakur, A. K., Chaudhari, P., Kumar, R., & Joshi, J. Understanding Household Energy Challenges in Himalayan Communities Using Participatory Design Approaches. In <i>International Design Engineering Technical Conferences and Computers and Information in Engineering Conference</i> (Vol. 85420, p. V006T06A039). American Society of Mechanical Engineers, August 2021
5	Mathur, C., Marwah, K. S., & Kumar, R. “An overview of the traditional and innovative approaches for capsaicinoids extraction from pepper”. <i>Virtual International Conference on Advances in Chemistry and Chemical Engineering 2021</i> , Sardar Vallabhbhai National Institute of Technology, Surat (Gujarat) India, April 16-17, 2021
6	Baghela, P., Katoch, R., & Kumar, R. “Microwave Assisted extraction of bioactive compounds: opportunities and challenges”. <i>Virtual International Conference on Advances</i>

	<i>in Chemistry and Chemical Engineering 2021</i> , Sardar Vallabhbhai National Institute of Technology, Surat (Gujarat) India, April 16-17, 2021
7	Sharma, S., Zaidi T. H., & Kumar, R. “Ultrasound Assisted extraction of bioactive compounds: opportunities and challenges”. <i>Virtual International Conference on Advances in Chemistry and Chemical Engineering 2021</i> , Sardar Vallabhbhai National Institute of Technology, Surat (Gujarat) India, April 16-17, 2021.
8	Gusain, K., Garg, S., & Kumar, R. “Solubility Prediction of Pharmaceutical Compounds in Pure Solvent by Different Correlations and Thermodynamic Models”. In <i>Proceedings of the International Conference on Advances in Chemical Engineering (AdChE)</i> , Feb 5-8, 2020.
9	Malik, A., Muqueet, A., & Kumar, R. “Preparation and characterization of solid dispersion of flufenamic acid by solvent evaporation method. In <i>Proceedings of the International Conference on Advances in Chemical Engineering (AdChE)</i> ” Feb 5-8, 2020.
10	Gupta, L., Devnarayan, D., & Kumar, R. “Experimental Study of Particle Size Reduction of Albendazole by Antisolvent Precipitation Method”. In <i>Proceedings of the International Conference on Advances in Chemical Engineering (AdChE)</i> . Feb 5-8, 2020.
11	Neha Saxena, Numair Shirqhi, Adithya Bontha, Amit K Thakur, Rahul Kumar, Pranava Chaudhari “Di-tube cleanup and recovery of oil from oil spills” In <i>Proceedings of the International Conference on Advances in Chemical Engineering (AdChE)</i> . Feb 5-8, 2020.
12	Kumar, R., Mahalingam, H., & Tiwari, K. K. “Selection of solvent in supercritical antisolvent process”. <i>APCBEE procedia</i> , 9, 181-186.
13	Kumar, R., Mahalingam, H., & Tiwari, K. K. “Droplet dynamics in supercritical antisolvent micronization process”. In <i>Proceedings of International Conference on Chemical, Biological and Environmental Engineering</i> , August 8-11, 2012

ADMINISTRATIVE RESPONSIBILITIES

1	Placement & Internship Coordinator for B. Tech Third year and Final year students (August 2021 -present)
2	Lab Incharge for Mass Transfer Lab (August 2020- Present)
3	Question Paper moderation committee member (2020-present)
4	Activity Coordinator for B. Tech Chemical Engineering Students (AY 2019-20)
5	Activity Coordinator for M. Tech Chemical Engineering Students (AY 2018-19)
6	Core Committee member of Department of Chemical Engineering for NBA Accreditation (2022)
7	Core Committee member from Department of Chemical Engineering for NAAC Accreditation (2021)
8	Core Committee member of Department of Chemical Engineering for NBA Accreditation (2019)
9	Established Chemical Engineering Department Research Lab in AY 2019-20
10	Lab Incharge for Heat Transfer Lab (AY 2016-17 to AY 2017-18)
11	Course Coordinator for B. tech Final Year (AY 2013-14 and AY 2015-16)

OUTREACH ACTIVITIES

1	Industrial visits to IOCL Vadodara and ONGC Ankhelshwar
2	Question paper setter and External Examiner for Practical viva for Bundelkhand Institute of Engineering & Technology Jhansi, Uttar Pradesh
3	Question Paper Setter for Practical viva for Bipin Tripathi Kumaon Institute of Technology Dwarahat, Uttrakhand
4	Delivered a invited lecture on “Computer Process Simulation Using DWSIM” on 9 th April 2021 in AICTE-ISTE sponsored Faculty Development Programme organized by Department of Chemical Engineering, Gharda Institute of Technology, Lavel, Maharashtra, India
5	Delivered a Career Guidance talk at DSB International School Rishikesh and NDS School Rishikesh on 11 th May 2023
6	To aware the students about chemical engineering, I wrote the following article on UPES blog https://blog.upes.ac.in/4-emerging-career-paths-for-chemical-engineers/

MEMBER OF PROFESSIONAL BODY

Life Member, IChE, Membership Number: LM-61716

CONFERENCES ORGANIZED

S. N	Conference	Role
1	Advances in Chemical Engineering – 2020 (AdChE-2020)	Organizing committee member
2	Energy Summit 2022	Secretary

JOURNALS REVIEWER

- 1 Environmental Chemistry Letters
- 2 International Journal of Chemical Reactor Engineering
- 3 ChemBioEng Reviews
- 4 International Journal of Thermodynamics
- 5 Journal of Applied Pharmaceutical Science
- 6 Particulate Science and Technology
- 7 Material Today: Proceedings
- 8 Bulgarian Chemical Communication
- 9 Chemical and Process Engineering : New Frontiers

PROJECTS AND FUNDING

Title	Amount	Time	Sponsor
Solubility enhancement of drugs by recrystallization using liquid anti-solvent. (Co-PI)	3.00 Lakhs	March 2018- March 2020	UPES
Solubility & dissolution rate enhancement of herbal compounds (PI)	4.65 Lakhs	May 2022 (continuing)	UPES
Spray Drying of Curcumin Nanosuspension (PI)	6 Lakhs	August 2023- August 2025	Indian Glycol Limited
Development of Process for Producing Ammonium Perchlorate of defined size distribution from crystallization Process (PI)	24.81 Lakhs	UNDER REVIEW	Indian Space Research Organization

EDITOR

1. Guest Editor of “Nanotechnology Application in Drug Delivery Processes”, a special issue published by PROCESSES, MDPI.
2. Co-editor of a book titled “Advanced Oxidation Process-based Integrated and Hybrid Technologies for Degradation of Pharmaceuticals and Personal Care Products” to be published by Elsevier

REFERENCES

Dr. Raj Kumar Arya Associate Professor Department of Chemical Engineering Dr. B. R. Ambedkar National Institute of Technology , Jalandhar-144011 Punjab (India) Phone: +91-9819588825 Email: aryark@nitj.ac.in	Prof. Santosh Kumar Gupta Department of Chemical Engineering Indian Institute of Technology Kanpur-208016 Uttar Pradesh (India) Phone: +91-9554272320 Email: skgupta@iitk.ac.in
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DECLARATION

I hereby declare that the information provided above is correct and accurate to the best of my knowledge and belief.

Dr. Rahul Kumar