



Dr. Mahmood Ahmed

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Profile Summary

Dr Mahmood Ahmed is an Assistant Professor of Chemistry at the Department of Chemistry, Division of Science and Technology, University of Education, College Road, Lahore, Pakistan. He received his M.Sc. (January 2003), M.Phil. (July 2013) and a PhD (March 2018) degree in Chemistry from the Institute of Chemistry, University of the Punjab, Lahore, Pakistan. He has over 22 years of experience in professional research and teaching. His expertise is in analytical, pharmaceutical, and medicinal chemistry. In the pharmaceutical industry (Renacon Pharma Ltd.), where he spent over 18 years, he led quality by design (QbD) projects to manufacture hemodialysis concentrates in Pakistan & Malaysia. His research interest involves the synthesis of novel drug analogs and testing them for various pharmacological properties. Additionally, his core analytical chemistry interest is the development, optimization, and validation of HPLC methods for stability indicating assays, as well as the analysis of drugs in accordance with international regulatory guidelines, including ICH, FDA, EMA & USP. He is also working on extracting trace, essential, toxic, and heavy metals from water, soil, and food items using techniques such as conventional acid digestion, ultrasound, and microwave-assisted extraction to characterize their potential toxicity to human health. His interests focus on the treatment of analytical data, including outlier identification in univariate and multivariate datasets, significance testing, signal-to-noise analysis, and univariate and multivariate calibration/validation. Also, he is exploring plant-mediated nanoparticles, microparticles, composites, hydrogel, and MOFs for drug delivery, and biodegradable films for food and biomedical applications. Teaching analytical, pharmaceutical, and medicinal chemistry, including laboratory practicals at the BS level, and supervising MS and PhD students in the same field. He has authored 154 peer-reviewed articles (impact factor: 389.4). He also authored 1 book and contributed 21 book chapters on biopolymer-based hydrogel, COF, wood composites, and drug delivery applications for books to be published in Wiley, Springer-Nature, ACS, RSC, CRC Press, and Elsevier. He is the editor/advisor of 6 International Journals. He has reviewed over 904 research/review articles for more than 120 journals hosted by Wiley, Springer Nature, ACS, RSC, De Gruyter, and Elsevier. Named an outstanding "Reviewer" for Analytical Methods by the Royal Society of Chemistry (RSC) for the year 2024. 28 MS and 4 PhD students have been supervised/co-supervised and/or are pursuing their degrees in analytical, pharmaceutical, and medicinal chemistry. Moreover, 21 of his abstracts were published in national and international conferences. He is ranked among the **2 % of scientists globally** (2024, 2025) by Elsevier/Stanford University, USA.

Google Scholar. <https://scholar.google.com.pk/citations?user=GAa1VMUAAAJ&hl=en> [Citation: 4050; h-index: 33]

Researcher ID. D-1320-2015, [Citation: 3010; h-index: 28], **ORCID.** <http://orcid.org/0000-0002-2285-7406>.

Scopus Author ID. 7402832094, [Citation: 3210; h-index: 29]

 <https://www.linkedin.com/in/dr-mahmood-ahmed-32714799/>

Teaching Philosophy

Dr Ahmed is passionate about teaching analytical, pharmaceutical, and medicinal chemistry and is committed to providing his students with a rigorous and engaging learning experience that will help them develop the skills and knowledge they need to succeed in their chosen careers. His teaching philosophy is centered on creating a student-centered learning environment that is both challenging and supportive. He believes that students learn best when they are actively engaged in the learning process, and he strives to create a classroom atmosphere that encourages active participation, critical thinking, and problem-solving. He uses a variety of teaching methods in his classes, including lectures, discussions, laboratory experiments, and group projects. His goal as a teacher is to help his students develop a deep understanding of chemistry and the skills they need to succeed in their chosen careers. He wants his students to be able to think critically, solve problems, and communicate their findings effectively. He is committed to providing his students with the best possible learning experience, and he is confident that he can continue to make significant contributions to the field of chemistry education.

Research Statement

He is passionate about chemistry and its potential to make a positive impact on the world. His research focuses on the synthesis of novel drug analogs/derivatives and testing them for various pharmacological properties against different phenotypes of various disease models. Also, he is exploring plant-mediated nanoparticles, microparticles, composites, hydrogel, and biodegradable films for food and biomedical applications, and MOF for drug delivery.

Contribution to UN Sustainable Development Goals

In 2015, UN member states agreed to 17 global Sustainable Development Goals (SDGs) to end poverty, protect the planet, and ensure prosperity for all. Dr Ahmed's work contributes towards the following SDGs:

Sustainable Development Goals		
	Goal 2: Zero hunger	5 documents
	Goal 3: Good health and well-being	40 documents
	Goal 6: Clean water and sanitation	5 documents
	Goal 7: Affordable and clean energy	15 documents
	Goal 8: Decent work and economic growth	3 documents
	Goal 9: Industry, innovation and infrastructure	7 documents
	Goal 11: Sustainable cities and communities	3 documents
	Goal 12: Responsible consumption and production	8 documents
	Goal 13: Climate action	4 documents
	Goal 14: Life below water	1 document
	Goal 17: Partnership for the goals	1 document

Education

1. PhD (Chemistry). March, 2018

Institute of Chemistry, University of the Punjab, Lahore-Pakistan

Thesis Title. Synthesis, characterization of novel curcumin analogs, and their biological activities

2. M. Phil. (Analytical Chemistry). July, 2013

Institute of Chemistry, University of the Punjab, Lahore-Pakistan

Thesis Title. Optimization and validation of RP-HPLC method for determination of organic acids in disinfectants and evaluation of their bactericidal activity against *E. coli*, *S. aureus*, and *P. aeruginosa*

3. M.Sc. (Analytical Chemistry). January, 2003

Institute of Chemistry, University of the Punjab, Lahore-Pakistan

Thesis Title. Analysis of phenol in textile effluents and their treatment by locally available adsorbents

Professional, Teaching & Research Experience

1. Assistant Professor (TTS)

Department of Chemistry, University of Education, College Road, Lahore-Pakistan: December 10, 2021, to date

2. Visiting Faculty

Department of Chemistry, University of Education, College Road, Lahore-Pakistan: March 4, 2020, to September 9, 2020

3. Head of Plant Operations/Management Representative

Renacon Pharma Limited, Lahore-Pakistan: July 1, 2020, to December 8, 2021

4. Head, Quality Operations and R&D/Management Representative

Renacon Pharma Limited, Lahore-Pakistan: November 1, 2019, to June 30, 2020

5. Quality Control Incharge/Management Representative

Renacon Pharma Limited, Lahore-Pakistan: September 20, 2005, to October 1, 2019

6. Analytical Chemist

Renacon Pharma Limited, Lahore-Pakistan: April 1, 2003, to September 20, 2005

Chemistry Courses & Research

1. Teaching analytical, pharmaceutical, and medicinal chemistry, including laboratory practicals at the BS & MS levels
2. Supervision of research students @ MS and PhD levels in the areas of analytical, pharmaceutical, and medicinal chemistry

PhD Supervision & Co-Supervision/Doctoral Advisory Committee

1. Sehar Basheer, Department of Chemistry, University of Education, Lahore. Session 2024-2009

[Supervision]

2. Shaista Perveen, Curcumin impregnated biopolymer based antimicrobial packaging films. Department of Chemistry, University of Education, Lahore. Session 2023-2028 **[Co-Supervision]**
3. Qurrat-ul-Aein Khan, Synthesis and Characterization of Clay-based Ternary Composites for Desulfurization of Fuels. School of Physical Sciences, University of the Punjab, Lahore, Session 2023-2027 **[Supervision]**
4. Rabbia Moid, STEM Education Department, University of Education, Lahore. Session 2023-2028 **[Member]**

5. Navid Aslam, Investigating the NDMA induced histological and genotoxic effects in male mice (Mus Musculus) and mitigative potential of vitamin E. Department of Zoology, University of Education, Lahore. Session 2023-2028 **[Member-Major area]**
6. Mabashar Siddique, Encapsulation of curcumin in novel metal-organic frameworks: Sustained release study and biological activities. Department of Chemistry, University of Education, Lahore. Session 2022-2027 **[Co-Supervision]**

M. Phil. Supervision & Co-Supervision

1. Silica-Coated Pyrazine-Based Bi-MOF Functionalized with Chitosan–Folic Acid: A Nanoplatform for Curcumin Encapsulation and Controlled Release. Ahmad Saeed, Department of Chemistry, University of Education, Lahore. Session 2024-2026 **[Supervision]**
2. Chitosan Gelatin Hydrogel Patches Containing Curcumin Loaded MOF for Antibacterial Activities. Eisha Eiman, Department of Chemistry, University of Education, Lahore. Session 2024-2026 **[Supervision]**
3. Ginger Mediated Ag-doped ZnO Nanoparticles Embedded in Curcumin-Loaded Chitosan/PVA Hydrogel for Antimicrobial Applications. Muhammad Hassan, Department of Chemistry, University of Education, Lahore. Session 2024-2026 **[Supervision]**
4. Synthesis Of Furan-Schiff Bases Contains Urea /Thiourea Moieties and Their Biological Activities. Kiran Naseer, Department of Chemistry, University of Education, Lahore. Session 2024-2026 **[Supervision]**
5. A Bi-MOF/Chitosan-Alginate Hydrogel Containing Curcumin as a Colorimetric Sensor for Ammonia Detection. Abeera, Department of Chemistry, University of Education, Lahore. Session 2024-2026 **[Supervision]**
6. Curcumin Impregnated Cassava Starch/Chitosan Film with Green Synthesized ZnO Nanoparticles for Antibacterial Activities. Zanib Shahzadi, Department of Chemistry, University of Education, Lahore. Session 2024-2026 **[Supervision]**
7. Cassava Starch/Sodium Alginate Hydrogel Loaded with NPK Fertilizer and Micronutrient Nanoparticles (Zn, Cu, And Mn) for Sustainable Agriculture. Maryam Asrar, Department of Chemistry, University of Education, Lahore. Session 2024-2026 **[Supervision]**
8. Investigation of trace and heavy metals in frozen and fresh meat products: An evaluation of human health risk. Tayyaba Khalid, Department of Chemistry, University of Education, Lahore. Session 2023-2025 **[Supervision]**
9. Heavy metals accumulation in pine needles through road dust. Determination by ICP-OES and their impact on human health. Sadaf Rashid, Department of Chemistry, University of Education, Lahore. Session 2023-2025 **[Supervision]**
10. Development of silver/silver oxide particles containing lemon peel extract and curcumin and their biological activities. Irum Sumbal, Department of Chemistry, University of Education, Lahore. Session 2023-2025 **[Co-Supervision]**
11. Development of biodegradable film containing biological macromolecules impregnated curcumin for food preservation. Ali Abbas Aslam, Department of Chemistry, University of Education, Lahore. Session 2023-2025 **[Co-Supervision]**

12. Development of biodegradable hydrogel film derived from chitosan-curcumin containing black seed extract-ZnO-NPs for packaging: Sehar Aftab, Department of Chemistry, University of Education, Lahore. Session 2023-2025 **[Co-Supervision]**
13. Biobase-MOF for Encapsulation of Curcumin to Enhance its Bioavailability: Sehar Basheer, Department of Chemistry, University of Education, Lahore. Session 2022-2024 **[Supervision]**
14. Exploring the New Therapeutic Targets of Non-Steroidal Anti-inflammatory Drug Derivatives: Rida Batool, Department of Chemistry, University of Education, Lahore. Session 2022-2024 **[Supervision]**
15. Synthesis and Application of Sulfonamide Schiff Bases as Chemosensors for the Detection of Cations in Aqueous Media: Maryam Ahmad Ali, Department of Chemistry, University of Education, Lahore. Session 2022-2024 **[Co-Supervision]**
16. Cu/Zr Based MOFs for Removal of Hazardous Metals from Tanneries Wastewater: Syed Muhammad Rehan Haider, Department of Chemistry, University of Education, Lahore. Session 2022-2024 **[Co-Supervision]**
17. Schiff bases Containing Sulfonamides: Synthesis, Characterization and their Biological Activities: Ujala Habib, Department of Chemistry, University of Education, Lahore. Session 2021-2023 **[Co-Supervision]**
18. Estimation of Toxic and Heavy Metals in Conventional Pakistani Sweets and Their Impact on Human Health: Amna Javed, Department of Chemistry, University of Education, Lahore. Session 2021-2023 **[Co-Supervision]**
19. Encapsulation of Curcumin in Novel γ -Cyclodextrin Metal Organic Framework: Sustained Release Kinetics and Solubility Studies: Muhammad Faheem, Department of Chemistry, University of Education, Lahore. Session 2021-2023 **[Co-Supervision]**
20. Investigation of Toxic Effects of Trace and Heavy Metals in Cosmetic Products on Human Health: Aamir Sohail, Department of Chemistry, University of Education, Lahore. Session 2021-2023 **[Supervision]**
21. Risk Assessment of Trace and Heavy Metals Exposure via Consumption of Different Types of Tea: Muhammad Ayyan Khan, Department of Chemistry, University of Education, Lahore. Session 2021-2023 **[Supervision]**
22. Potential human health risk assessment via consumption of Rice Planted in Soil contaminated with Toxic Metals. Muhammad Bilal, Department of Chemistry, University of Education, Lahore. Session 2021-2023 **[Co-Supervision]**
23. Synthesis and Characterization of Metal Curcumin Nanoparticles to enhance its bioavailability and therapeutic activities. Ayesha Asghar, Center for Bioinformatics and Drug Design, School of Biochemistry and Biotechnology, University of the Punjab, Lahore Session 2020-2022 **[Co-supervision]**
24. Development of Eco-Friendly High Performance Liquid Chromatographic Method for Analysis of Amiodarone and Metoprolol. Ammara Zahid, Institute of Pharmaceutical Sciences, University of Veterinary & Animal Sciences, Lahore Session 2020-2022 **[Co-supervision]**
25. Screening, detection and quantification of NDMA in nitrogen containing anti-depressant drugs. Ahmed Ali, Institute of Pharmaceutical Sciences, University of Veterinary & Animal Sciences, Lahore Session 2020-2022 **[Co-supervision]**

26. Development and Validation of New RP-HPLC Method for the Analysis of Sulfamethoxazole and Trimethoprim in Liquid Suspension and its Comparison with Compendial Method. Shahzad Ali, Department of Chemistry, University of Education, Lahore. Session 2019-2021 **[Co-supervision]**
27. Eco Friendly Ultra-Fast Chromatographic Method for the Determination of Cefixime and its E-Isomer in Active Pharmaceutical Ingredients. Sadia Inayat, Department of Chemistry, University of Education, Lahore. Session 2019-2021 **[Co-supervision]**
28. Comparison of Pasteurized and Unpasteurized Milk Quality in Lahore Region and Detection of Possible Adulterants by Using Standard Methods. Maria Akram, Department of Chemistry, University of Engineering and Technology, Lahore. Session 2018-2020 **[Co-supervision]**

Academic Professional Activities

1. Program Team Member (PTM) for Self-Assessment Report based on PREE Standard under PSG-2023, vide UE/R/2026/2, 01 January 2026, University of Education, Lahore-Pakistan
2. Member Industrial Liaison Committee, Linking UE with Industry, 2024, vide UE/R/2024/4407, 23 December 2024, University of Education, Lahore-Pakistan
3. Convener, Finance and Marketing Committee, 3rd International Conference on Trends and Research in Chemistry (TRIC-2024), 06-07 November 2024, University of Education, Lahore-Pakistan
4. Member, Compliance Implementation Plan (CIP), 2023, vide UE/S&T/2024/360, 02 July 2024, University of Education, Lahore-Pakistan
5. Member, Stock Taking at Central Library, University of Education, Lahore-Pakistan, vide UE/R/2024/2318, 02 May 2024
6. Paper Setter, PhD-Chemistry, University of Education, Lahore-Pakistan
7. Convener, Finance and Marketing Committee, 2nd International Conference on Trends and Research in Chemistry (TRIC-2023), 16-18 May 2023, University of Education, Lahore-Pakistan
8. Focal Person, MOU between University of Education and Novamed Pharmaceuticals (Pvt.) Limited, Lahore vide Notification No UE/R/2022/3342
9. Paper Setter, BS-Chemistry, University of Education, Lahore-Pakistan
10. Member Research Proposal Review Committee, Department of Chemistry, Division of Science and Technology, University of Education, Lahore-Pakistan
11. Member University Sports Committee (Football), Sports Week, 28 March to 01 April, 2022, University of Education, Lahore-Pakistan
12. Member Admission Committee, Department of Chemistry, Division of Science and Technology, University of Education, Lahore-Pakistan
13. Member Organizing Committee, 1st International Conference (online). Trends & Research in Chemistry (TRIC-2022), Jan. 18-19, 2022, Department of Chemistry, Division of Science and Technology, University of Education, Lahore-Pakistan:
14. Program Team Member to Prepare Self-Assessment Report of MS-Chemistry for Year 2021-2022, Department of Chemistry, Division of Science and Technology, University of Education, Lahore-Pakistan
15. External examiner for MS thesis, University of Lahore, Lahore-Pakistan
16. External examiner for MS thesis, Govt College University, Lahore-Pakistan
17. External examiner for BS thesis, FCC (A Chartered University), Lahore-Pakistan

18. External examiner for MS thesis- University of Veterinary & Animal Sciences, Lahore-Pakistan
19. External examiner for MSc thesis- University of the Punjab, Lahore-Pakistan
20. External examiner for B.Sc. practical papers- University of the Punjab, Lahore-Pakistan
21. External examiner for BS-MS thesis-University of the Punjab, Lahore-Pakistan

Editorship & Memberships

1. Guest Editor, Sustainability Special Issue on "Sustainable Crop Systems and Agricultural Products for Climate-Resilient Agriculture", MDPI (Basel, Switzerland)
2. Member, Society of Chemical Industry (SCI), Membership ID 240777, 14/15 Belgrave Square, London SW1X 8PS
3. Associate Editor, Future Journal of Pharmaceutical Sciences, Springer Nature
4. Lead Guest Editor, International Journal of Analytical Chemistry, Special Issue on "Comprehensive Analysis of N-Nitrosodimethylamine Exposure: Health Risks, Environmental Occurrence, and Regulatory Strategies"
5. Lead Guest Editor, Journal of Chemistry, Special Issue on "Exposure to Trace and Heavy Metals: Human Health Implications and Multivariate Data Analysis"
6. Regional Editor-Asia, Sustainable Food Connect, MBZ City, Abu Dhabi, UAE
7. Member, QUVAE Research and Publications, Anna Nagar, Chennai, Tamil Nadu 600040, India
8. Academic Board Member, ETERNO Press, Singapore 409051
9. Academic Editor, International Journal of Analytical Chemistry, John Wiley & Sons Ltd, USA
10. Member American Chemical Society, USA: Membership ID 30980472
11. Academic Editor, Journal of Chemistry, John Wiley & Sons Ltd, USA
12. Guest Associate Editor, Frontiers in Chemistry, Special Issue on "Non-sulfonamide Molecules as Human Carbonic Anhydrase Inhibitors"
13. Lead Guest Editor, Journal of Chemistry, Special Issue on "Toxic and Heavy Metals in Food Items"
14. Editorial Board Member, Indonesian Journal of Chemistry, Indonesia
15. Member Royal Society of Chemistry, UK: Membership ID 716868

Workshops, Seminars/Webinars & Conferences

1. Participation. HPLC Mobile Phases and Gradients, eLearning Phenomenex, December 10, 2025
2. Participation. Analytical Strategies for GLP-1 Agonists: Aggregation, Related Substances and Stability Workflows. eLearning Phenomenex, December 3, 2025
3. Participation. Chromatography Modes Explained: Sizing up SEC! eLearning Phenomenex, November 19, 2025
4. Participation. Chromatography Modes Explained: Mastering Reverse Phase, eLearning Phenomenex, August 13, 2025
5. Participation. How to Take Care of Your LC Column, eLearning Phenomenex, July 23, 2025
6. Participation. Chromatography Modes Explained: Dive into the Modes of Chromatography, eLearning Phenomenex, July 15, 2025
7. Participation. HPLC Mysteries Unveiled: Solving Retention Time and Resolution Challenges, eLearning Phenomenex, July 09, 2025
8. Training of Patent writing: Idea to Drafting, February 27, 2025, Business Incubation Center, University of Education, Lahore
9. Oral presentation as a guest speaker: 2nd National and 1st International 03 days Conference cum Workshop on Natural Products: Biological and Pharmaceutical Applications, Govt Women College University, Faisalabad, December 18-20, 2024
10. How Generative AI Changes Information Discovery, Wiley Research Training, 15 October 2024
11. Oral presentation. Ibuprofen conjugated sulfonamides as urease inhibitors. 6th International Cappadocia Scientific Research Congress. Organized by IKSAD Institute & Chirchik State Pedagogical University, Cappadocia-Nevsehir, Türkiye, 10-12 August 2024
12. Oral presentation as invited speaker: Chicken feathers derived carbon quantum dots for efficient photocatalytic degradation of methylene blue. International Conference on Material Chemistry and Industrial Technologies (MCIT). Department of Chemistry, The University of Lahore-Pakistan, April 24-25, 2024
13. Participation. Introduction to KnowItAll for spectrometry, Wiley Team, March 26, 2024
14. Oral Presentation. Essential and potentially toxic metals in traditional sweets in Pakistan: exposure assessment and human health implications. 5th International Conference on Global Practice of Multidisciplinary Scientific Studies, Baku, Azerbaijan, 10-12 December, 2023
15. Participation. Method Robustness and Transformability for Modern Size Exclusion Methods, eLearning Phenomenex, November 23, 2023
16. Participation. FDA's Analytical Method for PFAS Detection, eLearning Phenomenex, November 21, 2023
17. Participation. LC-MS: how to boost your chromatography, eLearning Phenomenex, November 15, 2023
18. Oral Presentation. Nano Particles of Nickel Oxide- Acacia Nilotica Leaf Extracts: Green Synthesis and Their Biological Activities. 2nd International Bogazici Scientific Studies Conference, Istanbul, Türkiye, 19-20 September, 2023
19. Oral Presentation. Cornmeal for the Synthesis of Biodegradable Plastic Films by Microwave Polymerization Technique. 4th International Black Sea Modern Scientific Research Congress, Rize, Türkiye, 6-7 June, 2023

20. Oral Presentation. Antirease Effect of Benzenesulfonohydrazides, In Vitro and In Silico Studies. 4th International Antalya Scientific Research and Innovative studies Congress, Antalya, Türkiye, 9-10 May, 2023
21. Oral Presentation. Investigation of Minerals in Fruit Peels Powder: Ultrasound Assisted Extraction Followed by Flame Atomic Absorption Spectrometry. International Conference on Global Practice of Multidisciplinary Scientific Studies-IV, Turkish Republic of Northern Cyprus, 28-30 April, 2023
22. Oral Presentation. Fabrication of Silver Nanoparticles as an Efficient Sensor for Quantification of Mercury in Aqueous Media. International Palandoken Scientific Studies Congress, Erzurum, Türkiye, 18-19 March 2023
23. Participation: Enhancing Your Imaging Workflows and Ultrastructural Data Using Biological EDS, 2 February 2023, Wiley Analytical Sciences
24. Oral Presentation. Alkyl Chain Linked Thiourea Derivatives: Synthesis, Biological Activities, In Vitro and In Silico Studies, II-International Congress on Modern Sciences, Tashkent, Uzbekistan, December 16-17, 2022
25. Oral Presentation. Trace and heavy metals in different types of sauces: Evaluation of human health risk, 3. International Hasankeyf Scientific Research and Innovation Congress, Batman, Türkiye, 17-18 December 2022
26. Oral Presentation. Contamination of Soil and Water by Toxic and Heavy Metals: Evaluation of Their Impact on Human, 3. International Cappadocia Scientific Research Congress, Cappadocia-Nevsehir, Türkiye, 11-12 December 2022.
27. Participation. Improvement in Sample Preparation and LC-MS Analysis of Therapeutic Oligonucleotides, eLearning Phenomenex, November 25, 2022
28. Participation. Harmonization of Ph. Eur. 2.2.46 and USP 621-New Allowed Adjustments, eLearning Phenomenex, November 16, 2022
29. Participation. Using Core Shell Particle Technology to Improve Micro and Nano LC Separations, eLearning Phenomenex, September 27, 2022
30. Oral Presentation, Title: Anti-Inflammatory and Antinociceptive Activities of Curcumin-Schiff Bases Containing Sulfonamides & Chair of Technical Session, (September 16, 2022). BILTEK-VI, 6. International Symposium on Current Developments in Science, Technology and Social Sciences, Malatya, Türkiye, September 16-18, 2022
31. Participation. Common LC Troubleshooting Mistakes and What to Do Instead, eLearning Phenomenex, September 20, 2022
32. Participation. How to choose your C18 Column, eLearning Phenomenex, September 08, 2022
33. Oral Presentation, Title: Screening of Curcumin-Schiff Bases Containing Sulfonamides as Antibacterial and Antifungal Agents, & Head of Session-3 (September 03, 2022). International Congress on Natural & Medical Sciences, Ege University, Izmir, Türkiye, September 02-04, 2022
34. Participation. An Overview of Preparative Chromatography, eLearning Phenomenex, August 30, 2022
35. Participation. Exploring LC Selectivity using Steroids in Clinical Setting, eLearning Phenomenex, August 25, 2022

36. Participation. Column selection for special cases: High throughput, High pH, High aqueous, High retention/resolution eLearning Phenomenex, August 4, 2022
37. Participation. Miniaturization and automation of oligonucleotide sample preparation, eLearning Phenomenex, July 28, 2022
38. Oral Presentation, Title: Non-Essential/Toxic Trace Metals in Vegetables: An Evaluation of Human Health Risk. June 25, 2022. International Conference on Global Practice of Multidisciplinary Scientific Studies Dedicated to the 100th Anniversary of "Georgian Technical University – GTU (online), Tbilisi-Georgia, Georgian Technical University, June 24-26, 2022
39. Participation. Advances in Sample Preparation Technique for extraction of Polar Analytes from Various Matrices, eLearning Phenomenex, June 15, 2022
40. Participation. GC Troubleshooting Tips and Tricks from Inlet through Detection, Phenomenex, May 26, 2022
41. Participation. Trouble shooting LC system contamination, eLearning Phenomenex, May 19, 2022
42. Participation. How to boost the selectivity of your separation in Flash Chromatography, eLearning Phenomenex, May 12, 2022
43. Oral Presentation, Title: Antibacterial effects of diazotized curcumin containing sulfonamides. April 28, 2022. International Scientific Research Congress (online), Dedicated to 30th Anniversary of Baku Eurasia University, Baku, Azerbaijan: April 28, 2022
44. Participation. Wiley Editor Seminar: The value of Open Research Publishing (online). Organizer, Wiley, April. 26, 2022
45. Oral Presentation, Title: Curcumin derivatives: Anti-inflammatory, analgesic, ulcerogenic, cyclooxygenase-2 inhibition and molecular docking studies April 15, 2022. CUKUROVA-8th International Scientific Researches Conference (online), Adana, Turkey: April 15-17, 2022
46. Poster exhibition in chemistry (PEC-2022), Department of Chemistry, University of Education, Lahore, April 14, 2022
47. Participation. United Nation Environment Programme-Global Environment Facility (UNEP-GEP) Project. 1st Pakistan National Biosafety Clearing House (BCH) Workshop (online). Feb 28-March 2, 2022
48. Oral Presentation, Title: Curcumin heterocyclics as urease inhibitors. In vitro biological activities and molecular docking studies. Feb.22, 2022. MAS 16th International European Conference on Mathematics, Engineering, Natural & Medical Sciences (online), Mardin, Turkey: Feb. 22-23, 2022
49. Oral Presentation, Title: Discovery of curcumin heterocyclics containing sulfonamides for carbonic anhydrase inhibition and molecular docking studies. Feb.18, 2022. International Euroasia Congress on Scientific Research and Recent Trends-IX (online), Antalya, Turkey: Feb. 18-20, 2022
50. Participation. Dissecting the scholarly publishing process. A current overview on the steps to getting published. Organizer, Wiley, Jan. 26, 2022
51. Oral Presentation, Title: Nutritious and Harmful Elements in Curcuma Longa L. A Source of Therapeutically Important Curcumin & Head of Session-2 (Jan. 22, 2022). 7th International Zeugma Conference on Scientific Research (online), Gaziantep, Turkey: Jan. 21-23, 2022
52. Oral Presentation, Title: Analytical Instrument Qualification and Method Validation (AIQ & MV)-A Scientific Approach & Head of Session-2 (Jan. 19, 2022). 1st International Conference (online). Trends

& Research in Chemistry (TRIC 2022), Department of Chemistry, Division of Science and Technology, University of Education, Lahore-Pakistan: Jan. 18-19, 2022

53. Participation. 25th National and 13th International Chemistry Conference, Institute of Chemistry, University of the Punjab, Lahore-Pakistan: October 20-22, 2014
54. Participation. Training Workshop on GMP Guidelines regarding Quality Management, Personnel Sanitation & Hygiene, and Premises & Good Documentation Practices as per WHO GMP guidelines. Lahore Chamber of Commerce & Industry: April, 2012.
55. Participation. International workshop on pharmaceutical equipment validation & Qualification and Calibration at NIPER- New Delhi, India: June 15, 2007
56. Participation. The kidney foundation's biennial symposium by Kidney Foundation Pakistan, February 23-26, 2006, Karachi

Trainings

1. Hands-on Training on Patent Drafting and Filing, University of Education, Lahore, October 9, 2025
2. Patent Writing: Idea to Drafting, University of Education, Lahore, February 27, 2025
3. Foundation of GMP: Active Pharmaceutical Ingredient (API), USP Education, August 11, 2021
4. Foundation of GMP: Data Integrity and Computer System Validation, USP Education, August 11, 2021
5. Foundation of GMP: Deviations, Root Cause Analysis (RCA) Tools and Corrective and Preventive Action (CAPA) - Sequence flow for handling of any non-conformance in the GMP environment, USP Education, August 04, 2021
6. Foundation of GMP: Medicinal Products, USP Education, August 04, 2021
7. Foundation of GMP: Auditing, USP Education, August 02, 2021
8. Foundation of GMP: Quality Risk Management, USP Education, August 02, 2021
9. Foundation of GMP: HVAC System, USP Education, June 08, 2020
10. Foundation of GMP: Qualification, USP Education, May 03, 2020
11. Foundation of GMP: Validation, USP Education, April 27, 2020
12. Foundation of GMP: Water Systems, USP Education, April 26, 2020
13. Training session on understanding the requirements of ETO Sterilization ISO 11135:2014 and Clean Room Manufacturing ISO 14644-1:2015 for Medical Devices. 20-21 April 2020, Online, Sialkot (Trainer)
14. ISO 13485:2016 Medical Device Quality Management Systems Transition Training Course, July 11-12, 2018, Sialkot
15. ISO 9001:2015 Quality Management System- Documentation & Internal Audit by SGS-Pakistan, Oct. 31- Nov. 01, 2016, Lahore
16. Revised MDD Directive 93/42/EEC (2007/47/EC) conducted by SGS-Pakistan, December 4, 2009, Lahore
17. CE marking for medical devices under directive 93/42/EEC & ISO 13485:2003 conducted by SGS-UK, Lahore, February, 9, 2007

Foreign Visits

1. Evaluation of Canaan Technologies, Nanjing & Wenzhou, China, for water treatment and blending systems. July, 29-30, 2019

2. Evaluation of OCI Medical (Member of LEPU medical group), Chengdu, China, for dialyzer. July, 26, 2019
3. Evaluation of Sanxin MedTec., Nanchang, China, for BTL and dialyzer. July, 26-27, 2019
4. Evaluation of BWT, Shanghai China, for water treatment system. July, 25, 2019
5. Evaluation of DC Pack & Lee Pack. Seoul South Korea, for liquid and powder filling line for haemodialysis plant, July, 21-24, 2019
6. Evaluation of MH Multipack Sdn. Bhd. Pinang Malaysia, for liquid filling line for haemodialysis plant, May, 27-29, 2019
7. China International Medical Equipment Fair (CMEF), Shanghai, China April, 11-13, 2018
8. Qualification of Sanxin MedTec., Nanchang, China, for BTL and dialyzer. April, 14-15, 2018
9. Leheng, Beijing, China, MVR related discussion for sodium chloride project April, 16-18, 2018
10. China International Pharmaceutical Machinery Exposition (CIPM), Chongqing, China April, 20-21, 2018.
11. Consultancy provision regarding haemodialysis concentrates to Well Pharma, Abu Dhabi, UAE: Feb. 16-19, 2016
12. Installation & operational activities in Renacon Pharma Sdn. Bhd., Malaysia: Nov. 12-20, 2014
13. R&D meeting (for product development regarding food supplement) with “DuPont USA” largest soy protein producing company, have an Asian regional office in - New Delhi, India: June 13-14, 2007

QMS, MDD & Data Handling Skills

1. **ISO 45001:2018**, Occupational health and safety management system- requirements with guidance for use, specifies requirements for an OH&S management system to enable organization to provide safe and healthy workplace by preventing work-related injuries and ill health as well as by proactively improving its OH&S performance.
2. **ISO 14001:2015**, Environmental management system-requirements with guidance for use, specifies the requirements for an environmental management system that an organization can use to enhance its environmental performance, seeking to manage its environmental policies in a systematic manner that contributes to environmental pillar of sustainability.
3. **ISO 11135:2014**, Sterilization of health-care products Ethylene oxide-Requirements for the development, validation and routine control of a sterilization process for medical devices.
4. **Site master file (SMF)**, Renacon Pharma Limited, a largest manufacturer of various types of haemodialysis concentrate (liquid & solid dosage form), and related products including disinfectants, sterilents in Pakistan. SMF is useful to the regulatory authorities & certified bodies in planning and conducting GMP inspections, MDD & QMS audits.
5. **MDD, European Directive 93/42/EEC**, Annexure II (excluding section 4) for manufacturing of haemodialysis concentrates.
6. **EN ISO 14971:2012**, Application of risk management to medical device, estimate and evaluates the risks, control these risks and monitor the effectiveness of control. This risk analysis is applicable to all stages of life cycle of all types of haemodialysis concentrates.
7. **ISO 23500-4:2019**, Concentrates for haemodialysis and related therapies, document includes concentrates in both liquid and powder forms, also specifies requirements for equipment used to mix acid and bicarbonate powders into concentrate at the user's facility.
8. **ISO 23500-3:2019**, Water for haemodialysis and related therapies, document includes water to be used in the preparation of concentrates, dialysis fluids for haemodialysis, haemodiafiltration and haemofiltration, and for the reprocessing of haemodialysers.
9. **ISO 14644:2015**, Cleanrooms and associated controlled environments, the classification of air cleanliness in terms of concentration of airborne particles in cleanrooms and clean zones; and separative devices as defined in ISO 14644-7.

10. **I.S. EN 1041:2008+A1:2013**, Information supplied by manufacturer of medical devices, European Standard specifies requirements for information to be supplied by a manufacturer for medical devices regulated by Council Directive 93/42/EEC concerning haemodialysis concentrates.
11. **ISO 15223-1:2016**, Medical devices - Symbols to be used with medical device labels, labelling and information to be supplied, document identifies requirements for symbols used in haemodialysis concentrates labelling that convey information on the safe and effective use of haemodialysis concentrates, which are marketed globally and therefore need to meet different regulatory requirements
12. **ISO 10993-1:2009**, Biological evaluation of medical devices - Part 1: Evaluation and testing within a risk management process, the assessment of the biological safety of the haemodialysis concentrates
13. **ISO 9001:2015** Quality management system, organization demonstrates its ability to consistently provide products and services that meet customer and applicable statutory and regulatory requirements
14. **ISO 13485:2016** Medical devices – Quality management systems - Requirements for regulatory purposes, a quality management system where an organization needs to demonstrate its ability to provide medical devices and related services that consistently meet customer and applicable regulatory requirements. Throughout the life-cycle including design and development, production, storage and distribution, installation, or servicing of a medical device and design and development or provision of associated activities such as technical support.

1. **MS Office**
2. **SPSS®**- software package used for interactive, or batched, statistical analysis
3. **ChemDraw**, analytical and chemical property data of structures and fragments
4. **ChemSketch**, molecular modeling program used to create and modify images of chemical structures
5. **GraphPad Prism**, scientific 2D graphing and statistics software
6. **Origin**, program for interactive scientific graphing and data analysis
7. **ArcGIS**, geographic information system for working with maps and geographic information
8. **BioRender**, a science illustration tool used to create high-quality diagrams for publications, presentations, posters etc.
9. **ImageJ**, designed for scientific image analysis and processing, offers extensive capabilities for tasks like measuring distances, counting particles, and analyzing cellular structures.
10. **MestReNova**, a powerful, multi-vendor software suite designed to seamlessly process and analyze data from NMR, LC/GC-MS, and Electronic & Vibrational Spectroscopic techniques.
11. **Canva**, a great tool for creating visual content.
12. **Design-Expert**, provides powerful tools to lay out an ideal experiment on your process, mixture or combination of factors and components
13. **X'Pert HighScore Plus**, powerful XRD analysis software to identify crystalline phases by matching experimental diffraction patterns to extensive reference databases

Book

1. **Mahmood Ahmed***, Syed Salman Shafqat. Curcumin Bioavailability and Sustainability as Therapeutic Agent: Strategies for Sustained Release Curcumin, ISBN: 9780443291968, Elsevier BV

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8. **Mahmood Ahmed***, Ahmad Saeed, Ali Abbas Aslam, Mian Habib-ur-Rahman Mahmood. Covalent Organic Frameworks (COFs) in CO₂ Adsorption, in Book: Advanced Materials for CO₂ Adsorption. Royal Society of Chemistry
9. **Mahmood Ahmed***, Muhammad Zaeem Mehdi, Ali Abbas Aslam, Qudsia Kanwal. An overview of mucoadhesion theories and the anatomy and physiology of various mucosal surfaces, in Book: Mucoadhesive Polymer Formulations: Mucosal Drug Delivery and Tissue Engineering Applications. Scrivener Publishing LLC, Wiley
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11. **Mahmood Ahmed***, Maryam, Ali Abbas Aslam, Polymer-based hydrogels, in Book: Biopolymer-Based Materials for Medical Applications, ISBN: 9780443330520, Elsevier BV
12. **Mahmood Ahmed***, Maryam, Ali Abbas Aslam, Hydrogels Based on Cellulose and Its Derivatives: Preparation, Properties and Applications, in Book: Cellulose Technologies, ISBN: 9780443383199, Elsevier BV
13. **Mahmood Ahmed***, Ali Abbas Aslam, Mudassar Sana Ullah, Awais Ali Aslam. Nanotube Technology-Modified Biopolymers for Water Remediation, in Book: Engineered 1D and 2D Biopolymers for Water Purification and Biomedical Applications, ISBN: 9780443277955, Elsevier BV

14. **Mahmood Ahmed***, Maryam, Ali Abbas Aslam, Awais Ali Aslam. Advanced Biopolymer-Based Filter Paper for Water Purification, in Book: Engineered 1D and 2D Biopolymers for Water Purification and Biomedical Applications, ISBN: 9780443277955, Elsevier BV
15. **Mahmood Ahmed***, Muhammad Zaeem Mehdi, Ali Abbas Aslam. Wood-based Composites: Compositions, Construction Strategies, Surface Modifications, Mechanics, Unique Properties, Challenges and Future Perspectives, in Book: Wood-based Composites: Chemistry, Design Formulations, Properties and Applications, ISBN: 9780443277597, Elsevier BV
16. **Mahmood Ahmed***, Ali Abbas Aslam, Ahmad Saeed, Awais Ali Aslam. 3D-printed polysaccharide biofilms for environmental remediation, in Book: 3D Engineered Polysaccharides: Advanced Sustainable Materials for Future Engineering and Bioengineering Applications, Springer-Nature
17. **Mahmood Ahmed***, Ali Abbas Aslam, Ahmad Saeed, Awais Ali Aslam. Polysaccharides-based 3D hydrogels for advanced food applications, 3D Engineered Polysaccharides: Advanced Sustainable Materials for Future Engineering and Bioengineering Applications, Springer-Nature
18. **Mahmood Ahmed***, Ahmad Saeed, Maryam, Ali Abbas Aslam, Riaz Hussain. Valorisation of Citrus waste-An approach to zero waste biorefinery, in Book: Extraction, characterization and biological activity of citrus flavonoids, Royal Society of Chemistry
19. **Mahmood Ahmed***, Ahmad Saeed, Ali Abbas Aslam, Riaz Hussain. Bio-inspired basalt fiber composites: Design and applications, in Book: Advances in Basalt Fibers and Their Composites. American Chemical Society
20. **Mahmood Ahmed***, Muhammad Ahmad, Abdul Samad. Remediation of heavy metals contamination using clay, metal oxides and hybrid materials, in Book: Advanced Nanomaterials for Water Purification. Springer-Nature
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2. Mahmood Ahmed, Sulfonamides: A Promising Pharmacophore as Carbonic Anhydrase Inhibitor. CPQ Medicine 2018 2 (3): 1-2
3. Mahmood Ahmed, Curcumin: An Important Phytochemical. CPQ Medicine 2018 1 (5): 1-2
4. Mahmood Ahmed, Metal Contamination in Milk: A Potential Human Health Toxicity. CPQ Nutrition (2018) 1 (6): 1-2

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2. Misbah Irshad, **Mahmood Ahmed***, Ali Abbas Aslam, Mohammed H. AL Mughram, Mehwish Khushi, Affifa Tajammal, Masooma Irfan, Muhammad Muddassar. Appraisal of antioxidant scavenging and antibiofilm capacities of pyrazolic, isoxazolic-based chalcones and aurones: Synthesis, molecular docking, simulation, and ADME properties. Letters in Drug Design & Discovery, 2026, **Impact factor: 1.6**

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4. Faryal Tahir, Muhammad Adnan, Muzammil Hussain, Riaz Hussain, Zobia Irshad, Hany W. Darwish, **Mahmood Ahmed**, Malik Muhammad Asif Iqbal. Deciphering the role of tilde-shaped rhodanine-based non-fullerene acceptor materials for efficient organic photovoltaics. *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*, 2026, 350, 127287, **Impact factor: 4.6**
5. Sana Besnaci, Nedjoud Grara, Samira Bensoltane, Taib Bouarroudj, Hadia Hemmami, Yamine Babouri, Masooma Irfan, Mohammed H. AL Mughram, Ali Abbas Aslam, **Mahmood Ahmed***. Individual and Combined Effects of Nickel Oxide and Magnesium Oxide Nanoparticles on Oxidative Stress and Hepatopancreas Integrity in the Terrestrial Sentinel *Helix aspersa*. *Journal of Applied Toxicology*, 2026, **Impact factor: 2.8**
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8. Aaida Shafiq, Muzammil Hussain, Riaz Hussain, Zobia Irshad, Hany W. Darwish, **Mahmood Ahmed**, Malik Muhammad Asif Iqbal, Muhammad Adnan. Impact of Molecular Side-Chain Modifications on Triphenylamine-Based Materials as Donors for Organic and as Hole Transporting Materials for Perovskite Solar Cells. *Energy Technology*, 2025, e202501285, **Impact factor: 3.6**
9. Muzammil Hussain, Hira Naz, Zobia Irshad, Riaz Hussain, Hany W. Darwish, **Mahmood Ahmed**, Fakhar Hussain, Fatiqa Zafar, Muhammad Adnan. Molecularly Modified Quinoxaline-Based Unfused Non-Fullerene Acceptors for Efficient and Stable Organic Photovoltaics. *Journal of Computational Biophysics and Chemistry*, 2025, **Impact factor: 2.3**
10. **Mahmood Ahmed***, Asnuzilawati Asari, Muhammad Zaeem Mehdi, Mohammed H. AL Mughram, Ujala Habib, Riaz Hussain, Muhammad Yaseen, Arslan Usman, Mushkbar Fatima, Masooma Irfan, Ali Abbas Aslam. Sulfonamide derivatives targeting urease: Structural diversity and therapeutic potential. *Arabian Journal of Chemistry*, 2025, **Impact factor: 5.2**
11. **Mahmood Ahmed***, Muhammad Zaeem Mehdi, Mehwish Javed, Mohammed H. AL Mughram, Masooma Irfan, Ahmad Saeed, Ali Abbas Aslam. Structural Advances in Non-Sulfonamide Carbonic Anhydrase Inhibitors: Insights into Design, Bioactivity, and Binding Mechanism. *Archiv der Pharmazie – Chemistry in Life Sciences*, 2025, 358, e70090 **Impact factor: 3.6**

12. Dure Najaf Iqbal, Sohail Khaliq, Muhammad Zaeem Mehdi, Mohammed H. AL Mughrام, **Mahmood Ahmed***. Porphyrin/metalloporphyrin and their conjugates: a promising platform for drug delivery. *Molecular Diversity*, 2025, **Impact factor: 3.8**
13. **Mahmood Ahmed***, Rida Batool, Shahab Saqib, Mian Habib-ur-Rahman Mahmood, Muhammad Imtiaz Shafiq, Riaz Hussain, Aamir Sohail, Mudassar Sanaullah, Menier Al-Anazi, Hussain Raza. Exploring the structural development of drug derivatives for various therapeutic targets: Insightful review for drug repurposing. *Journal of Molecular Structure*, 2025, 1346, 143162, **Impact factor: 4.7**
14. Amel Benamara, Nedjoud Grara, Samira Bensoltane, Laid Bouchaala, Amel Laouar, Kamila Grara, Hadia Hemmami, Boudjahem Abdelghani, Ali Abbas Aslam, **Mahmood Ahmed***. Metabolic and oxidative responses in *Helix aspersa* to iron oxide nanoparticle exposure: individual and combined ($\text{Fe}_2\text{O}_3/\text{SiO}_2$) effects. *Journal of Nanoparticle Research*, 2025, 27, 165, **Impact factor: 2.1**
15. Aqib Rahman, Nuzhat Jamil, Muhammad Yasir, Muhammad Nauman Aftab, Qudsia Kanwal, Muhammad Zubair Kamran, Ali Abbas Aslam, Muhammad Zaeem Mehdi, Hamda Akhtar, **Mahmood Ahmed***. Toxicity of nanomaterials in the environment: a critical review of current understanding and future directions. *Journal of Nanoparticle Research*, 2025, 27, 147, **Impact factor: 2.1**
16. Misbah Irshad, **Mahmood Ahmed***, Ali Abbas Aslam, Muhammad Naeem, Khairia Mohammed Al-Ahmmary, Fatimah Algarni, Huda A. Al-Ghamdi, Shayan Moazzam, Mariyam Nawaz, Muhammad Muddassar. Exploring the potential of biphenyls as promising multi-enzyme inhibitors: Synthesis, molecular docking, and dynamic simulation studies. *Journal of Molecular Structure*, 2025, 1342, 142690, **Impact factor: 4.7**
17. Sadaf Sarfraz, Muhammad Ahmad, Abdul Barri, Abid Ali, Muhammad Luqman, Ghalib Ul Islam, Shahid Amin, Muhammad Abdul Qayyum, Khairia Mohammed Al-Ahmmary, **Mahmood Ahmed***, Applicability of Supported Liquid Membranes for Extraction of Zn^{2+} and Ni^{2+} in Water Using Cyclohexylamine as a Carrier. *Journal of Chemistry*, 2025, Article ID 1743726, 12 Pages, **Impact factor: 2.8**
18. Parsa Saeed, Muhammad Adnan, Zobia Irshad, Riaz Hussain, Hany W. Darwish, Muzammil Hussain, **Mahmood Ahmed**, Jae Kwan Lee. Molecular Engineering of Unidirectional Non-Fused π -Bridge Containing Asymmetric Non-Fullerene Acceptors for High-Performance Organic Solar Cells. *Energy Technology*, 2025, 13, 2402465, **Impact factor: 3.6**
19. Iftikhar-Ul-Haq, **Mahmood Ahmed***, Ali Abbas Aslam, Fatima Aftab, Mudassar Sanaullah, Riaz Hussain, Eisha Eiman, Awais Ali Aslam, Tanveer A. Wani, Seema Zargar. Multivariate analysis of potentially toxic metal contents in soil and vegetables: Enrichment, bioconcentration, translocation from soil to vegetables, and assessment of human health toxicity. *Food and Chemical Toxicology*, 2025, 200, 115413, **Impact factor: 3.5**
20. Salwa, Muhammad Adnan, Zobia Irshad, Riaz Hussain, Hany W. Darwish, Fakhar Hussain, **Mahmood Ahmed**. Improving Optoelectronic Properties of Acceptor-Donor-Acceptor-Type Non-Fullerene Acceptors Containing Extended Fused Ring Donor Units for Efficient Organic Semiconductors. *Energy Technology*, 2025, 13, 2401529, **Impact factor: 3.6**
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24. Shoomaila Latif, Shahid Ahmad, Bilawal Mustafa, Mirza Muhammad Adnan Baig, Muhammad Imran, Khairia Mohammed Al-Ahmary, **Mahmood Ahmed***. Development and characterization of dual-doped bismuth tungstate: Enhanced electrical and photocatalytic properties for renewable energy and environmental applications. *Inorganic Chemistry Communications*, 2025, 173, 113819, **Impact factor: 4.4**

25. Hina Liaquat, Muhammad Imran, Zohaib Saddique, Shoomaila Latif, Khairia Mohammed Al-Ahmary, Aamir Sohail, Hussain Raza, **Mahmood Ahmed***. Exploring the versatility of hydrogen-bonded organic frameworks: Advances in design, stability, and multifunctional applications. *Journal of Molecular Structure*, 2025, 1321, 140221, **Impact factor: 4.0**

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