

# Dr. Muhammad Ahmad



Assistant Professor of Chemistry  
Division of Science and Technology (DSNT)  
University of Education, Lahore-54770, Pakistan  
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Email: [dr.muhammad.ahmad@ue.edu.pk](mailto:dr.muhammad.ahmad@ue.edu.pk) & [muhammad.ahmad@fulbrightmail.org](mailto:muhammad.ahmad@fulbrightmail.org)

I started my PhD program in fall 2014 on prestigious Fulbright Scholarship at the Michigan State University, USA. After successfully passing my entire PhD course work and comprehensive exams from the Michigan State University, I moved with my research group to the University of Notre Dame, USA. I completed rest of my research project at the University of Notre Dame under the auspices of Professor Dr. Merlin L. Bruening (a Donald and Susan Rice Professor of Engineering). I graduated with a PhD in Chemistry (Physical & Analytical Chemistry) in August 2020 from the University of Notre Dame, USA. During my PhD program in USA, I published my research work in prestigious international journals and presented my research work in NAMS and GORDON conferences of the years 2018 and 2019. I was awarded with the “Energy Fellowship” too and my PhD research project was sponsored by the U.S. Department of Energy, USA. Furthermore, I have a distinguished educational career and have the honor of securing several academic certificates of merit and distinctions on securing top positions in BSc degree from the Government College University Lahore and in MSc and MPhil degrees from the Quaid-i-Azam University Islamabad. I have a good experience of serving as a Scientific Officer at the Pakistan Nuclear Regulatory Authority, as a Teaching and Research Assistant at the Michigan State University, as a Research Assistant at the University of Notre Dame, and as an Assistant Professor at the Lahore Garrison University. I joined the University of Education Lahore as an Assistant Professor of Chemistry in December 2021. My current research interests include achievement of highly selective and current efficient separations of ions in electro dialysis, synthesis and characterization of nanocomposites for their applications as energy storage devices, preparation and applications of transition metal porphyrin complexes, synthesis of biodegradable films, and fabrication of electrode materials for efficient water splitting.

Google Scholar: <https://scholar.google.com/citations?user=bOEwJkAAAAJ&hl=en>

ORCID: <http://orcid.org/0000-0003-2405-169X>

Profile on University's Website: <https://ue.edu.pk/empprofile.php?id=2018>

## Professional Experience

12.2021 – PRESENT	<b>University of Education, Lahore-54770, Pakistan</b> Assistant Professor of Chemistry
03.2021 – 12.2021	<b>Lahore Garrison University, Lahore, Pakistan</b> Assistant Professor of Chemistry
10.2020 – 02.2021	<b>University of Okara, Pakistan</b> Assistant Professor of Chemistry (Visiting Faculty)
01.2017 – 08.2020	<b>University of Notre Dame, IN 46556, USA</b> Research Assistant
05.2016 – 12. 2016	<b>Michigan State University, MI 48823, USA</b> Research Assistant
08.2014 – 05.2016	<b>Michigan State University, MI 48823, USA</b> Teaching Assistant
09.2013 – 07.2014	<b>Pakistan Nuclear Regulatory Authority, Islamabad, Pakistan</b> Scientific Officer (National Environmental Monitoring Program)
10.2010 – 05.2013	<b>Rawal Cadet College, Rawalpindi, Pakistan</b> Lecturer of Chemistry

## Educational History

01. 2017 – 08.2020	<b>University of Notre Dame, IN 46556, USA</b> Ph.D (Physical and Analytical Chemistry)
08. 2014 – 12. 2016	<b>Michigan State University, MI 48824, USA</b> Ph.D (Physical and Analytical Chemistry) transferred to the University of Notre Dame, USA
09. 2008 – 10. 2010	<b>Quaid-i-Azam University Islamabad 45320, Pakistan</b> M.Phil (Physical Chemistry)
09. 2006 – 08. 2008	<b>Quaid-i-Azam University Islamabad 45320, Pakistan</b> M.Sc (Chemistry)
09. 2004 – 08. 2006	<b>Government College University Lahore 54000, Pakistan</b> B.Sc (Chemistry, Physics & Mathematics)

## Dissertation Titles

**PhD:** Selective ion dialysis through ion-exchange membranes coated with polyelectrolyte multilayers

**M.Phil:** Electrochemical analysis of persistent organic pollutants in potable and waste-water

## Standardized Exams Taken

- **GRE (Graduate Record Examination)-General** by ETS (Educational Testing Service), USA: Verbal = 154/170 (62 %ile), Quantitative = 163/170 (89 %ile), Analytical Writing Assessment = 4/6.
- **GRE Subject (Chemistry)** by ETS USA: 760 (68 %ile)
- **TOEFL (Test of English as a Foreign Language)-internet Based Test** by ETS, USA: 102/120 (Reading 28/30, Listening 18/30, Speaking 28/30, Writing 28/30)
- **GAT (Graduate Assessment Test)-General** by NTS (National Testing Service), Pakistan: 76 (99.65 %ile)
- **GAT Subject (Chemistry)** by NTS, Pakistan: 79 (92.18 %ile)

## Skills

- ICP-OES
- Interface Chemistry
- Layer by layer modification of membranes
- Ellipsometry & Scanning Electron Microscopy
- Knowledgeable in IR Spectroscopy
- Chromatographic Techniques
- Advanced Chemical Research
- Membrane Science and Processes
- Highly Selective Electrodialysis
- Ion separation with nanofiltration
- Electrochemistry (Cyclic Voltammetry)
- Creating thin ion-exchange coatings

## Publications (Total Impact Factor >200)

### Year 2023

1. R Zahoor, I U Khan, A Munawar, M Ahmed, **M Ahmad**, A Shahid, Evaluation of 68Ga-labelled nanoconjugates of dodecane tetraacetic acid-bombesin for targeting gastrin releasing peptide receptors as effective tumor marker, *International Journal of Analytical Chemistry* **2023**. (Under Review)
2. M Ahmed, **M Ahmad**, Curcumin nanoparticles: Physiochemical fabrication, characterization, antioxidant, enzyme inhibition, molecular docking and simulation studies, *RSC Advances* **2023**. (Under Review)
3. S Muqaddas, H Aslam, S U Hassan, A R Ashraf, M A Asghar, **M Ahmad**, A Haider, A Nazir, M Kaleli, S kyürekli, A Ali, Electrodeposited CoNi@CNTs fiber for efficient counter electrode in flexible dye-sensitized solar cells, *ACS Omega* **2023** (Under Review)
4. Q Kanwal, M Ahmed, A Ur-Rehman, A Anwar, S Shahid, A Shahzad, A S Bukhari, **M Ahmad**, N Yousaf, M Muddassar, Hypolipidemic effect of chloroform extract of *Lagenaria siceraria*: Potential inhibitory activity of phytochemicals targeting the HMG-CoA reductase revealed by molecular docking and simulation studies, *Journal of Chemistry* **2023** (Under Review)
5. F Rehman, N Alam, M Sohail, **M Ahmad**, M I Siddiqui, M I Irshad, A Mumtaz, Boosting the photoexcited charge collection and transportation via BiVO<sub>4</sub>/Fe-TiO<sub>2</sub>N NRs in type-II heterojunction for efficient photoelectrochemical water splitting, *Journal of Photochemistry & Photobiology, A: Chemistry* **2023**, 444, 1-9 (Impact Factor: 5.141)
6. M A Qayyum, T Farooq, A Baig, T H Bokhari, M N Anjum, M H R Mahmood, A R Ashraf, K Muddassir, **M Ahmad**, Assessment of essential and toxic elemental concentrations in tumor and non-tumor tissues with risk of colorectal carcinoma in Pakistan, *Journal of Trace Elements in Medicine and Biology* **2023**, 79, 127234. (Impact Factor 3.995)
7. W Ahmad, M Zubair, M Ahmed, **M Ahmad**, S Latif, A Hameed, Q Kanwal, D N Iqbal, Correction to assessment of potentially toxic metal(loid)s contamination in soil near the industrial landfill and impact on human health: an evaluation of risk, *Environmental Geochemistry and Health* **2023**, 1. (Impact Factor 4.898)
8. S Muqaddas, H Aslam, S U Hassan, A R Ashraf, M A Asghar, **M Ahmad**, A Haider, A Nazir, M Kaleli, S kyürekli, A Ali, Electrochemical sensing of glucose and ascorbic acid via POM-based CNT fiber electrode, *Materials Science & Engineering: B* **2023**, 292. (Impact Factor 3.407)
9. M Saleem, A I Durani, A Asari, M Ahmed, **M Ahmad**, N Yousaf, M Muddassar, Investigation of antioxidant and antibacterial effects of citrus fruits peels extracts using different extracting agents: Phytochemical analysis with in silico studies, *Heliyon* **2023**. (Impact Factor 3.776)
10. M I Din, M Ahmed, **M Ahmad**, S Saqib, W Mubarak, Z Hussain, R Khalid, H Raza, T Hussain, Novel and facile synthesis of carbon quantum dots from chicken feathers and their applications as photocatalyst to degrade methylene blue dye. *Journal of Chemistry* **2023**, 2023 (Impact Factor 3.241)

11. **M Ahmad**, M Ahmed, Characterization and applications of ion-exchange membranes and selective ion transport through them: a review, *Journal of Applied Electrochemistry* **2023**, 53 (4), pp. **(Impact Factor 2.929)**
12. A Asghar, A Tajammal, S Ashiq, S Hussain, **M Ahmad**, K Sian, N Al-Zaqri, A Boshala, B Iqbal, M A Bodlah, Eco-friendly dye of olive fruit peel and its color fastness applications on wool/silk fabrics, *Polish Journal of Environmental Studies* **2023**, 32(3), 1-5. **(Impact Factor 1.871)**
13. S Hussain, M A Muazzam, M Ahmed, **M Ahmad**, Z Mustafa, S Murtaza, J Ali, M Ibrar, M Shahid, M Imran, Green synthesis of nickel oxide nanoparticles using *Acacia nilotica* leaf extracts and investigation of their electrochemical and biological properties, *Journal of Taibah University for Science* **2023**, 17(1), 2170162. **(Impact Factor 3.459)**
14. W Ahmad, M Zubair, M Ahmed, **M Ahmad**, S Latif, A Hameed, Q Kanwal, D N Iqbal, Assessment of potentially toxic metal(loid)s contamination in soil near the industrial landfill and impact on human health: an evaluation of risk, *Environmental Geochemistry and Health* **2023**, 1-17. **(Impact Factor 4.898)**
15. M I Din, M Ahmed, **M Ahmad**, M Iqbal, Z Ahmad, Z Hussain, R Khalid, A Samad, Investigating the Activity of carbon fiber electrode for electricity generation from waste potatoes in a single-chambered microbial fuel cell, *Journal of Chemistry* **2023**, 2023. **(Impact Factor 3.241)**
16. M F Javed, M Zahra, I Javed, S Ahmad, T Jabeen, **M Ahmad**, Development and validation of RP HPLC method for the estimation of methyl paraben sodium and propyl paraben sodium in iron protein succinylate syrup, *Acta Chromatographica* **2023**, 35(1), 52-59. **(Impact Factor 2.011)**
17. S Hussain, R Kiran, **M Ahmad**, M Saqib, K S Munawar, M Shahid, M Waqas, S Massey, R Jaweria, R Baby, Synthesis, spectroscopy and biological studies of triphenyltin (IV) derivatives with carboxylated Schiff bases, *Journal of the Iranian Chemical Society* **2023**, 1-13. **(Impact Factor 2.271)**
18. S Muqaddas, M Javed, S Nadeem, M A Asghar, A Haider, **M Ahmad**, A R Ashraf, A Nazir, M Iqbal, N Alwadai, A Ahmad, A Ali, Carbon nanotube fiber-based flexible microelectrode for electrochemical glucose sensors, *ACS Omega* **2023**, 8(2), 2272-2280. **(Impact Factor 4.132)**
19. **M Ahmad**, M Ahmed, S Hussain, A Ali, M Zahra, M I Din, Z Mustafa, Polyelectrolyte multilayer coating of aliphatic polyamide anion-exchange membranes to increase monovalent/divalent anions selectivity in electro dialysis, *Desalination* **2023**, 545, 116159. **(Impact Factor 11.211)**

## Year 2022

20. M Mujahid, S Latif, M Ahmed, W Shehzadi, M Imran, **M Ahmad**, A Asari, M Jehangir, Z Mahmud, Modified matrix solid phasedispersion-HPLC method for determination of pesticide residue in vegetables and their impact on human health: A risk assessment, *Frontiers in Chemistry* **2022**, 10, 1084350. **(Impact Factor 5.545)**
21. M Ibrar, Y Ayub, R Nazir, M Irshad, N Hussain, Y Saleem, **M Ahmad**, Garlic and ginger essential oil-based neomycin nano-emulsions as effective and accelerated treatment for skin wounds' healing and inflammation: In-vivo and in-vitro studies, *Saudi Pharmaceutical Journal* **2022**. **(Impact Factor 4.562)**
22. M A Ahmad, S Hussain, **M Ahmad**, M Waqas, M Ibrar, G Yasmeen, A review on selective synthesis and yield enhancement of ortho-nitrophenol in the presence of phase-transfer catalysts, *Pakistan Journal of Scientific & Industrial Research Series A: Physical Sciences* **2022**, 65(3), 302-308. **(Impact Factor 0.27)**
23. M I Din, M Ahmed, **M Ahmad**, T Ghaffar, Z Hussain, R Khalid, A Samad, Novel and facile synthesis of biodegradable plastic films from cornmeal by using the microwave polymerization technique, *Journal of Chemistry* **2022**, 2022. **(Impact Factor 3.241)**
24. A Rehman, S Hussain, **M Ahmad**, M Riaz, M A Abid, T G Shazady, Evaluation of Thrombolytic Potential of *Elaeagnus rhamnoides* (L.) A. Nelson, *Scientific Inquiry and Review* **2022**, 6(3), 94-110. **(HEC Y-Category)**
25. S Hussain, M A Ahmad, **M Ahmad**, A Nisar, A Asghar, M Suleman, S Barkaat, M Riaz, M Nisar, Economical synthesis of nitrophenols under controlled physical parameters, *Proceedings of the Pakistan Academy of Sciences: Part A* **2022**, 59(2), 31-42. **(Impact Factor 0.11)**
26. I Akber, S Hussain, **M Ahmad**, M Riaz, M A Abid, S M Abbas, A Javed, M Hafeez, Doping of multi alkali and transition metals: Strengthening of electronic & NLO properties of Al<sub>12</sub>N<sub>12</sub> nanocages, *Pakistan Journal of Engineering and Applied Sciences* **2022**, 31, 1-11. **(Impact Factor 0.36)**
27. R Anwar, S Hussain, M A Abid, **M Ahmad**, M Javed, M Pervaiz, Pharmacological and phytochemical potential of *Aloe Barbadosis* (A comprehensive review), *LGU Journal of Life Sciences* **2022**, 6(2), 107-123. **(HEC Y-Category)**
28. W Mirza, S Hussain, **M Ahmad**, M Murtaza, A Rauf, A Aslam, G Yasmeen, T Arif, A Nazir, I Hanif, Sources and chemistry of flavonoids: an overview of their biological and therapeutic potential, *Scientific Inquiry and Review* **2022**, 6(2), 32-58. **(HEC Y-Category)**
29. M Faizan, M Javed, **M Ahmad**, S Hussain, S Nadeem, F Feroz, A Rauf, L Rasool, A Ibrar, M Fatima, Effectiveness of face masks and respiratory aid devices for prophylaxis against COVID-19, *LGU Journal of Life Sciences* **2022**, 6(1), 22-37. **(HEC Y-Category)**

30. A Mueez, S Hussain, **M Ahmad**, A Raza, I Ahmed, M Amjad, Green synthesis of nanosilver particles from plants extract, *International Journal of Agriculture, Environment and Bioresearch* **2022**, 7(1), 96-122 (**Impact Factor 1.710**)
31. **M Ahmad**, S Hussain, M A Abid, A Mumtaz, M Ibrar, S Muhammad, Creating bipolar junction by depositing ultrathin anion-exchange coating on cation-exchange membrane to dissociate water in electro dialysis, *Journal of Membrane Science and Research* **2022**, 8(1), 540358. (**Impact Factor 3.00**)

### Year 2021

32. L Yang, C Tang, **M Ahmad**, A Yaroshchuk, M L Bruening, Correction to high selectivities among monovalent cations in dialysis through cation-exchange membranes coated with polyelectrolyte multilayers, *ACS Applied Materials and Interfaces* **2021**, 13 (18), 22073. (**Impact Factor 10.383**)
33. S Rafique, S Hussain, **M Ahmad**, M Amjad, Synthesis, characterization and applications of silver nanoparticles, *Journal of Chemical Research Advances* **2021**, 2(2), 20-29. (**Impact Factor 1.310**)
34. N Mahmood, M A Muazzam, **M Ahmad**, S Hussain, W Javed, Phytochemistry of *Allium Cepa* L. (Onion): An overview of its nutritional and pharmacological importance, *Scientific Inquiry and Review* **2021**, 5(3), 41-59. (**HEC Y-Category**)

### Year 2020

35. **M Ahmad**, M, A Yaroshchuk, M L Bruening, Moderate pH changes alter the fluxes, selectivities and limiting currents in ion transport through polyelectrolyte multilayers deposited on membranes, *Journal of Membrane Science* **2020**, 616, 118570. (**Impact Factor 10.53**)

### Year 2019

36. **M Ahmad**, C Tang, L Yang, A Yaroshchuk, M L Bruening, Layer-by-layer modification of aliphatic polyamide anion-exchange membranes to increase  $\text{Cl}^-/\text{SO}_4^{2-}$  selectivity, *Journal of Membrane Science* **2019**, 578, 209-219. (**Impact Factor 10.53**)

### Year 2018

37. L Yang, C Tang, **M Ahmad**, A Yaroshchuk, M L Bruening, High selectivities among monovalent cations in dialysis through cation-exchange membranes coated with polyelectrolyte multilayers, *ACS Applied Materials and Interfaces* **2018**, 10, 44134-44143. (**Impact Factor 10.383**)

### Year 2017

38. **Y Zhu**, **M Ahmad**, L Yang, M Misovich, A Yaroshchuk, M L Bruening, Adsorption of polyelectrolyte multilayers imparts high monovalent/divalent cation selectivity to aliphatic polyamide cation-exchange membranes, *Journal of Membrane Science* **2017**, 537, 177-185. (**Impact Factor 10.53**)

### Before year 2017

39. S Ahmed, **M Ahmad**, S B Butt, Electrooxidation of chloro, nitro and amino substituted phenols in aqueous medium and their heterogeneous kinetics, *Research on Chemical Intermediates* **2012**, 38, 705-722. (**Impact Factor 3.10**)
40. S Ahmed, **M Ahmad**, S B Butt, I Afghani, M Iqbal, Voltammetric monitoring of gamma radiolytic degradation of phenols, *Journal of Applied Electrochemistry* **2012**, 42, 607-614. (**Impact Factor 2.929**)

## Courses Taught

- **Spring 2023:** Advanced Physical Chemistry (BS level course), Nanochemistry (MS level course), Radio and Nuclear Chemistry (BS level course), Fundamentals of Organic Chemistry (BS level course)
- **Fall 2022:** Quantum Chemistry and Gas Phase Equilibrium (BS level course), Surface Chemistry (MS level course), Fundamentals of Physical Chemistry (BS level course)
- **Spring 2022:** Radio and Nuclear Chemistry (BS level course), Quantum Chemistry and Gas Phase Equilibrium (BS level course), Organic Polymer Chemistry (MS level course), Advanced Physical Chemistry (BS level course)
- **Fall 2021:** Fundamentals of Physical Chemistry (BS level course), Quantum Chemistry and Gas Phase Equilibrium (BS level course)
- **Spring 2021:** Electroanalytical Techniques (MS level course), Physical Chemistry (BS level course), Advanced Analytical Chemistry (BS level course)
- **Fall 2020:** Mathematics for Chemist (BS level course)

## Research Projects

### As a Principal Investigator (PI)

- “Preparation of Pharmaceutical Grade Sodium Chloride from Rock Salt by Electrodialysis through Highly Charge Selective Membranes” submitted to Higher Education Commission of Pakistan for Technology Development Fund (TDF). (In Process)
- “Production of stabilized per-acetic acid for the cold sterilization of biomedical equipment” submitted to Higher Education Commission of Pakistan for Rapid Technology Transfer Grant (RTTG). (In Process)
- “Effectiveness of metal nanoparticles impregnated clay tablets as point of use water treatment” submitted to the United States Educational Foundation in Pakistan for Alumni Small Grants. (In Process)
- “Purification of rock salt to pharmaceutical grade sodium chloride by highly selective electrodialysis” submitted to Higher Education of Pakistan for Pakistan Innovation Fund (PIF). (In Process)

#### **As a Co-Principal Investigator (Co-PI)**

- “Conversion of chicken feather waste into nano-fertilizer for sustainable agriculture” submitted to Higher Education Commission of Pakistan for Rapid Technology Transfer Grant (RTTG). (In Process)

#### **As a PhD Candidate**

- Worked as an “Energy Fellow” on a research project of Division of Chemical Sciences, Geosciences, and Biosciences, Office of Basic Energy Sciences of the U.S. Department of energy through Grant DE-SC0017618.

### **Additional Grants & Fundings**

- Won a grant of \$2000 US (PKR 570,000) from the United States Educational Foundation in Pakistan (USEFP) for international conference on Trends and Research in Chemistry, TRIC-2023 organized by the Department of Chemistry, Division of Science and Technology, University of Education, Lahore on 16-18 May, 2023.

### **Contributions in Books**

- Ahmed, M.; Ahmad, M. (2023) Remediation of heavy metals contamination using clay, metal oxides and hybrid materials. Springer Nature. (Submitted)
- Ahmed, M.; Ahmad, M. (2023), Synthesis of clay, metal oxides and hybrid materials. Springer Nature. (Submitted)
- Ahmed, M.; Ahmad, M. (2023), Nano heterostructures in carbon based materials and applications. Taylor & Francis. (Submitted)
- Ahmed, M.; Ahmad, M. (2023), Nano heterostructures in metal oxides and hydroxides. Taylor & Francis. (Submitted)
- Ahmed, S.; Ahmad, M.; Butt, S.B. (2010) Sustainable water management in developing countries: challenges and opportunities. In: Memon, F.A. (ed) Electrochemical analysis of persistent organic pollutants in potable and waste water: electrooxidation of some chlorophenols on glassy carbon. University of Exeter, Cornwall, pp 45-53.

### **Conferences and Presentations**

1. 1st International & 2nd National Conference on Environmental Challenges & Material Sciences held at the Department of Chemistry, Shaheed Benazir Bhutto University, Shaheed Benazirabad. **Presentation (as a keynote speaker):** Highly selective and current efficient monovalent/divalent ion separations in electrodialysis through modified ion-exchange membranes. (March 6-7, 2023)
2. 3rd International Conference on Physics "Innovation in Material Science & Nanotechnology held at the Physics Department of Lahore Garrison University, Lahore, Pakistan. **Presentation (as an invited speaker):** Understanding the tradeoff between the selectivity and the permeance of ion-exchange membranes". (January 30-31, 2023)
3. V-International Halich Congress on Multidisciplinary Scientific Research organised by IKSAD Institute held at Istanbul, Turkiye. **Presentation:** "Increasing the current efficiency for selective transport through ultrathin films coated on anion-exchange membranes". (January 15-16, 2023)
4. 9th International Mardin Artuklu Scientific Research Conference organised by IKSAD Institute held at Mardin, Turkiye. **Presentation:** "Improving the electrodialysis transport characteristics of polyelectrolyte multilayers deposited on ion-exchange membranes". (January 20-22, 2023)
5. 3rd International conference on Advances in Materials Science organized by Department of Physics, DSNT held at University of Education, College Road, Lahore. **Presentation:** "Selective and current efficient transport through coated ion-exchange membranes". (December 15-16, 2022)
6. 6th international AEGEAN conferences on natural & medical sciences held at Izmir, Turkey. **Presentation:** "Small pH changes in the solution pH considerably affect the transport characteristics of polyelectrolyte multilayers deposited on membranes". (December 20-22, 2022).

7. 3rd International Cappadocia Scientific Research Congress organized by IKSAD institute held at Cappadocia-Nevsehir, Turkiye. **Presentation:** "Creation of anion-exchange coating on cation-exchange membrane to split H<sub>2</sub>O in electrodialysis for clean energy". (December 11-12, 2022)
8. IV-International Baku Conference on Scientific Research held at Baku, Azerbaijan. **Presentation:** "Dissociation of H<sub>2</sub>O in electrodialysis through cation-exchange membranes coated with ultrathin anion-exchange films". (November 30-December 1, 2022)
9. 6th International IconTech Conference on Innovative Surveys in Positive Sciences held at Rijeka, Croatia. **Presentation:** "Effect of small pH alterations on the transportation properties of ions and limiting currents through polyelectrolyte multilayers deposited on membranes". (December 4-5, 2022)
10. 1st International Conference on Trends & Research in Chemistry (TRIC 2022) held at the Department of Chemistry, Division of Science & Technology, University of Education, Lahore 54770, Pakistan. **Presentation:** "Modification of ion-exchange membranes for a selective transport through them". (January 18-19, 2022)
11. 27th annual meeting of NAMS (North American Membrane Society) held at Hilton Lexington, Lexington, KY, USA. **Presentation:** "Coating of anion-exchange membranes with polyelectrolyte multilayers to increase Chloride/Sulfate selectivity in electrodilysis". (June 9-13, 2018)
12. 28th Annual Meeting of NAMS (North American Membrane Society), Pittsburgh, PA, USA. **Presentation:** "Layer-by-layer modification of aliphatic polyamide anion-exchange membranes to increase chloride/sulfate selectivity". (May 11-15, 2019)

## Seminars

- Organizer of a one-day seminar on "Chemistry and Pharmaceutics" held on March 16, 2023 at the Department of Chemistry, Division of Science and Technology, University of Education, College Road, Lahore.

## Trainings and Workshops

- Participated as a TA (teaching assistant) in several workshops conducted by the Michigan State University USA and the University of Notre Dame USA to improve and hone the teaching skills of participants.
- Participated as a faculty member in the faculty development program (FDP) organized by the Lahore Garrison University, Lahore, Pakistan
- Level-1 course for technical government officers at Pakistan Nuclear Regulatory Authority HQ's Islamabad from 11-2013 to 12-2013.
- One month on job training in Radiological Environmental Monitoring at Pakistan Institute of Nuclear Science and Technology, Nilore Islamabad from 23rd December 2013 to 23rd January 2014
- 3rd National Workshop on Monitoring, Data Interpretation and Source Apportionment of Air Pollution held at PINSTECH/PIEAS from 14-18th April, 2014.

## Distinctions

- **PhD Fulbright Award** (2014-2019) by the U.S. Department of State, USA to pursue PhD degree in USA.
- **PhD Energy Fellowship** by the U.S. Department of Energy, USA.
- **Certificate of Merit** by the Government College University Lahore on getting top position in B.Sc degree.
- **Certificate of Merit** by the Quaid-i-Azam University, Islamabad on getting top position in M.Sc Chemistry degree.
- **Certificate of Merit** by the Quaid-i-Azam University, Islamabad on getting top position in M.Phil Physical Chemistry.
- **Shield on excellent performance** as a Scientific Officer for the year 2013-2014 in Pakistan Nuclear Regulatory Authority.

## MS/MPhil Students Produced

### Under Direct Supervision

- **Sheza Qureshi**, Reg. No: 21-UE-02022 (University of Education, Lahore), Session 2021-23, Dissertation Title: Synthesis and characterization of ZnS/ZnO nanocomposites and their applications as energy storage devices.
- **Muhammad Ahmad Mujeeb**, Reg. No: 21-UE-01991 (University of Education, Lahore), Session 2021-23, Dissertation Title: Synthesis of inner and outer transition metal porphyrin complexes for catalytic applications.
- **Maryam Ahmad Ali**, Reg. No: 22-UE-01300 (University of Education, Lahore), Session 2022-24, Dissertation Title: Synthesis of Schiff bases and their applications as chemo sensors for heavy and hazardous metals.
- **Syed Muhammad Rehan Haider**, Reg. No: 22-UE-02688 (University of Education, Lahore), Session 2022-24, Dissertation Title: Metal organic frameworks for the estimation of heavy and hazardous metals present in the waste water.

## Under Co-Supervision

- **Muhammad Ayyan Khan**, Reg. No: 21-UE-02378 (University of Education, Lahore), Session 2021-23, Dissertation Title: Investigation of essential, trace and heavy metals in different samples of tea: The impact on human health.
- **Akhtar Rasul**, Reg. No: Sp-2020/M.Phil-CHEM./015 (Lahore Garrison University, Lahore), Session 2020-22, Dissertation Title: Synthesis of Na-alginate and parthenium biochar based composite for waste water treatment
- **Shamas Riaz**, Reg. No: 20-UE-01564 (University of Education, Lahore), Session 2020-22, Dissertation Title: Electrolytic water splitting for efficient oxygen evolution reactions using carbon nanotubes and their composites.
- **Israr Ahmad Kundi**, Reg. No. M.PHIL-CHEM-S20-9003 (Lahore Garrison University, Lahore), Session 2020-22, Dissertation Title: Estimation and removal of chromium from tanneries waste water by using cerium based metal organic frameworks.
- **Muhammad Abubakar Khan**, Reg. No: Sp-2020/MPhil-Chem/024 (Lahore Garrison University, Lahore), Session 2020-22, Dissertation Title: Method development and selective validation for ormaigliptin (an anti-diabetic drug using UHPLC).
- **Zuhaib Akhtar**, Reg. No: Sp-20/MPhil-Chem/024 (Lahore Garrison University, Lahore), Dissertation Title: Synthesis of graphene oxide and silver oxide nanocomposite for photocatalytic degradation of imidacloprid pesticide.
- **Aamir Sohail**, Reg. No: 21-UE-02112 (University of Education, Lahore), Dissertation Title: Investigation of trace and heavy metals in cosmetic products and evaluation of their toxic effect on human health :A risk assessment study.
- **Bushra Ihsan**, Reg. No: 20-UE-03229 (University of Education, D.G.Khan Campus), Dissertation Title: DFT evaluation of agnostic and syndetic components in benzylamine palladium (II) chloride complexes.
- **Tahira Bibi**, Reg. No: 20-UE-03688 (University of Education, D.G. Khan Campus), Dissertation Title: DFT evaluation agnostic and  $\Pi$ -syndetic components in 1-cyclohexene imine PdCl<sub>2</sub> complexes.

## Services as a Reviewer

- Journal of Chemistry (Hindawi)
- International Journal of Analytical Chemistry (Hindawi)
- Journal of Membrane Science & Research (Membrane Processing Research Laboratory)
- Journal of Applied Electrochemistry (Springer)
- Polymer (Elsevier)

## Services as an External Examiner

Conducted viva voce examination of following MS/MPhil students at

- **University of Lahore (UoL)**: Hira Aslam (PCHEM02211040), Zarqa Rasheed (PCHEM02211071),
- **University of Management and Technology (UMT)**: Sana Iqbal (F2019140042), Komal Aroosh (S2019140032), Awais Raza (F2019140015)

## Personal Information

**Date of Birth:** August 23, 1988, **Place of Birth:** Okara (Pakistan)

**Citizenship:** Pakistan, **CNIC:** 35301-7391207-5, **Passport No:** TG1152073

Marital status: Single

## Extracurricular Activities

- Movie watching
- Gardening & Agriculture
- Community Services
- Music listening
- Socialization with friends and family
- Help to the students

## References

### ➤ **Professor Dr. Merlin L. Bruening**

Department of Chemical and Biomolecular Engineering, University of Notre Dame, IN 46556, USA  
Phone office: 001-574-631-3024, Email: [mbruenin@nd.edu](mailto:mbruenin@nd.edu)

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