



DR. SALMA SHAD

PH.D CHEMISTRY

CONTACT

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<https://scholar.google.com/citations?user=DrX9ZKcAAAAJ&hl=en>

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INSTRUMENTS HANDLING

- ◆ UV-VISIBLE SPECTROPHOTOMETER (UV-VIS)
- ◆ TRANSMISSION ELECTRON MICROSCOPE (TEM)
- ◆ SCANNING ELECTRON MICROSCOPE (SEM)
- ◆ ENERGY-DISPERSIVE X-RAY (EDX)
- ◆ DYNAMIC LIGHT SCATTERING ANALYSIS (DLS)
- ◆ ATOMIC FORCE MICROSCOPE (AFM)
- ◆ NANOPARTICLE TRACKING ANALYSIS (NTA)
- ◆ FOURIER TRANSMISSION INFRARED SPECTROSCOPY (FTIR)



ABOUT ME

Salma Shad (Ph.D), is a detail-oriented chemist specializing in inorganic/analytical chemistry. She has expertise in nanoparticles/nanocomposites, nanofabricated polymeric membranes, doped/co-doped nanocomposites, microplastics, biocidal activities, and solar cells. Dr. Shad's research focuses on nano-catalysis, photo-catalysis, photodegradation, biomedical applications, chemical absorption, and optoelectronic properties. With a strong background in inorganic/analytical chemistry, she brings extensive experience to materials science and nanobiotechnology. She is actively involved in developing new applications and products, generating intellectual properties, and providing technical solutions. Dr. Shad is skilled in instrument monitoring and analytical method performance, positioning her as a dynamic researcher ready to contribute innovative solutions at the intersection of chemistry and cutting-edge technologies.



EDUCATION

> PH.D (CHEMISTRY)

09/05/2015 – 12/18/2020

Hazara University Mansehra, KPK Pakistan / University of Birmingham, United Kingdom

Field of study: Chemistry, Physical sciences

Thesis: Synthesis of ZVM Nanoparticle and Application in Mineralization of Organic Herbicides Using Membrane

> M.PHIL (CHEMISTRY)

09/05/2012 – 04/13/2015

Hazara University Mansehra, KPK Pakistan

Field of study: Chemistry

Thesis: Analysis of some selected Pesticides in the vegetables of Siran valley

> M.SC (CHEMISTRY)

09/05/2010 – 06/06/2012

Hazara University Mansehra, KPK Pakistan

Field of study: Chemistry

> B.SC (PHYSICAL SCIENCE)

09/05/2008 – 08/23/2010

Hazara University Mansehra, KPK Pakistan

Field of study: Biological and related sciences

> FACULTY OF SCIENCE (F.SC)

08/01/2004 – 08/05/2006

Board of Intermediate and Secondary Education (BISE) Abbottabad

Field of study: Pre Medical

> MATRIC

03/01/1993 – 06/23/2004

Board of Intermediate and Secondary Education (BISE) Abbottabad

Field of study: Sciences

> MASTER OF EDUCATION (M.ED)

03/05/2016 – 03/29/2018

Allama Iqbal Open University (AIU) Islamabad

Field of study: Science Education

> BACHELOR OF EDUCATION (B.ED)

03/05/2014 – 01/14/2016

Allama Iqbal Open University (AIU) Islamabad

Field of study: Science Education



EXPERIENCE

> VISITING LECTURER

01/03/2024 – 28/06/2025

DEPARTMENT OF CHEMISTRY, THE UNIVERSITY OF HARIPUR, HARIPUR, KPK PAKISTAN
As a Visiting Lecturer in Chemistry, I teach courses such as Advanced Applied Chemistry and Analytical Chemistry, guiding students and conducting impactful research in the field.

> ASSISTANT PROFESSOR

11/05/2022 – 01/07/2023

DEPARTMENT OF CHEMISTRY, THE UNIVERSITY OF HARIPUR, HARIPUR, KPK PAKISTAN
As an Assistant Professor in Chemistry, I teach courses such as Advanced Applied Chemistry and Analytical Chemistry, guiding students and conducting impactful research in the field.

> ASSISTANT PROFESSOR (IPFP FELLOW)

11/05/2021 – 11/04/2022

DEPARTMENT OF CHEMISTRY, THE UNIVERSITY OF HARIPUR, HARIPUR, KPK PAKISTAN
Completed NFDIP training at NAHE Pakistan, selected as IPFP- Fellow by HEC Islamabad. As an Assistant Professor in Chemistry, I design and teach various courses, including Advanced Applied Chemistry and Analytical Chemistry. My responsibilities extend to delivering lectures, designing assessments, guiding students, and conducting impactful research in the field.

SOFTWARE PROFICIENCY

LABORATORY SOFTWARE:

CHEMDRAW
LABVIEW
IMAGE J

ANALYTICAL SOFTWARE:

ORIGIN
X-PERT HIGH

DATA ANALYSIS:

PYTHON (NUMPY, PANDAS)

PROJECT MANAGEMENT:

MICROSOFT PROJECT
ASANA

DOCUMENT PREPARATION:

LATEX
MICROSOFT OFFICE SUITE

LANGUAGE

ENGLISH ● ● ● ● ●

URDU ● ● ● ● ●

PASHTO ● ● ● ● ●

ARABIC ● ● ● ● ●
(WRITING & READING)

HOBBIES

● READING

● WRITING

● TRAVELING

● RESEARCHING



GRADUATE RESEARCHERS SUPERVISED

- > Fabrication and Characterization of Graphene Oxide integrated CuO/ZnO Nanocomposite Based Photoanode for Photovoltaic Application
- > Hierarchical Graphene Oxide/ZIF-8@ZIF-67 Nanocomposite for Sustainable 4-Nitrophenol Photoreduction in Wastewater
- > Bimetallic Doped CuO Nanoparticles: Synthesis, Characterization and Evaluation of Biological Applications
- > Tuning The Optoelectronic Properties of Bi₂O₃ Semiconductor by Metal Doping and Applications in Solar Cell
- > Synthesis Of Zn-Doped TiO Nanoparticles Using Zanthoxylum Armatum Dc. Extract
- > Synthesis of TiO Nanoparticles Using Berberis Lyceum Royle Extract
- > Green Synthesis of Iron Doped Titanium Dioxide Nanoparticles Using Morus Alba L. And Their Biomedical Applications
- > Ethnobotanical Study of Medicinal Plants in Sajikot Havelian



RESEARCH INTEREST

- > Synthesis/Characterization
 - > Nanoparticle/Nanocomposites
 - > Nanofabricated Polymeric Membranes
 - > Doped /Co-doped Nanocomposite
 - > Microplastics
 - > Solar Cells
- Applications**
- > Nano-catalysis / Photo-catalysis / Electrocatalysis
 - > Photodegradation / Chemical Absorption
 - > Optoelectronic properties of Semi-conductors in Solar Cells
 - > Antimicrobial / Biomedical Applications
 - > Wastewater Treatment / water Remediation
 - > Analysis / Detection / Adsorption / Removal (Pesticides, Heavy Metals, dyes, and toxic chemicals)
 - > Toxicology



RECENT PUBLICATIONS

- **Shad, S.**, Kareem, L., Uddin, S. T., Qazi, N. U. S., Ibrar, A., & Iqbal, M. (2025). Facile synthesis of Ag-doped NiO nanoparticles for efficient photocatalytic degradation of ciprofloxacin and evaluation of biological activities. *Separation Science and Technology*, 1-20. <https://doi.org/10.1080/01496395.2025.2566191>
- Usman, M., **Shad, S.**, Zaki, Z. I., (2025). Synthesis of MOF-derived Mn-doped ZnO nanostructures for efficient removal of microplastic from wastewater. *Inorganic Chemistry Communications*, 114349. <https://doi.org/10.1016/j.inoche.2025.114349>
- Tahir, S., Iqbal, M., **Shad, S.**, Nisa, S., Ibrar, A. (2024). Biosynthesis of Zr doped WO₃ Nanoparticles: Evaluation of Antibacterial, Antioxidant, and Enzymatic Activities. *Microbial Pathogenesis*, 107192. <https://doi.org/10.1016/j.micpath.2024.107192>
- Fatima, K., Rahman, S., Ayub, A., **Shad, S.**, Siddiq, M. (2024). Super porous cryogels loaded with silver nanoparticles: An effective antibacterial agent and catalyst for rapid reduction of dyes. *Inorganic Chemistry Communications*, 113760. <https://doi.org/10.1016/j.inoche.2024.113760>
- Batool, A., Azizullah, A., Ullah, K., **Shad, S.**, Khan, F. Zeb, U. (2024). Green synthesis of Zn-doped TiO₂ nanoparticles from Zanthoxylum armatum. *BMC Plant Biology*, 24(1), 820. <https://doi.org/10.1186/s12870-024-05525-3>
- **Shad, S.**, Bashir, N., & Lynch, I. (2024). Low-cost iron nanoparticles for remediation of agricultural pollution: adsorption of herbicides bromoxynil and paraquat. *Environmental Science: Nano*. <https://doi.org/10.1039/D3EN00835E>

COURSES TAUGHT

Graduate Level (Ph.D./ M.S):

- Advanced Applied Chemistry (CHEM-803)
- Nanomaterials (UNI-COMP-5)
- Research methodology and research Ethics (UNI-COMP-5)

Undergraduate Level (BS/ M.sc):

- Analytical Chemistry (CHEM -111)
- Environmental Chemistry (CHEM-231)
- Basic Chemistry (CHEM-302)
- Applied Chemistry (CHEM -242)
- Inorganic Chemistry (CHEM- 351)
- Advanced Analytical Techniques (CHEM -231)
- Industrial Chemistry (CHEM -101)
- Nanomaterials (CHEM -364)
- Inorganic Chemistry-I (CHEM -III)
- Inorganic Chemistry-III (CHEM -361)
- Polymer Chemistry (CHEM-207)
- F-Block Elements and Magneto
- Chemistry (CHEM-304)
- Thermodynamics (CHEM-306)
- Organometallics (CHEM-405)
- Advanced Chemistry Laboratory III (CHEM-320)
- Biochemistry -II

- Kareem. L, **Shad. S**, Siddiq. M, Farooq. M, Haleem. A, Ayub. (2024). Facile synthesis and characterization of Palladium loaded hydro-philic cryogels for catalytic and bactericidal applications. *Emergent Materials*. <https://doi.org/10.1007/s42247-024-00661-w>
- Shad, S.**, Ibrar, A., Bibi, A., Ayub, A., Iqbal, M., Lal, B., & Thebo, K. H. (2024). Single-step wet chemical synthesis of Co-doped Bi₂O₃ photoanode for dye sensitized solar cells. *Emergent Materials*, 1-8. <https://doi.org/10.1007/s42247-024-00627-y>
- Hanif. K, Irfan. U, **Shad. S**, Maria E. Malvolti, Ming Yue, Kotb A. Attia, Arif A. Mohammed, (2023). Population genetics informs new insights into the phylogeographic history of *Juglans regia* L.", *Genetic Resources and Crop Evolution*. <https://doi.org/10.1007/s10722-023-01597-6>
- Fiaz. S, **Shad. S**, Zeb. U, Iqbal. M, Uddin. I. (2023). Facile One-Step Synthesis of Gold Nanoparticles using *Viscum Album* Linn and Evaluation of their Anti-Bacterial Potential. *Functional Plant Biology*. <https://doi.org/10.1071/FP22161>
- Haider. A, Bashir. N, Rauf. A, Haroon. H, Naz. S, **Shad. S**. (2023). Synthesis of Tungsten-Cerium doped Titanium oxide nanocatalyst to remediate water by the degradation of Atrazine herbicide. *Journal of Nano Research*. 2022, 77,47-63. <https://doi.org/10.4028/p-hb1aa7>
- Rehman. Z, Nawaz, **Shad. S**, ElSayed Din, Razan A. Alshgari, (2023). Synthesis and characterization of Ni nanoparticles by microemulsion technique and their applications for energy storage devices. *Materials*. 16, 325.<https://doi.org/10.3390/ma16010325>
- Shad. S**, Lynch. I, Syed Waqar Hussain Shah, Bashir. N. (2022). Enhanced remediation of pesticides from water using a nanofabricated cellulose membrane embedded with silver nanoparticles. *Membranes*. 12(11), 1035. <https://doi.org/10.3390/membranes12111035>
- Ali. A, Alharthi. S, **Shad. S**, Hammad Al-Shaalan. N, Iqbal. M. (2022). Preparation of polar embedded C18 stationary phase for efficient separation of peptides and proteins in high-performance liquid chromatography. *Journal of Chromatography A*. <https://doi.org/10.1016/j.chroma.2022.463534>
- Iqbal. M, Ibrar. A, Ali. A, Hussain. S, **Shad. S**, Ullah. S, & Thebo. K. H. (2022). Facile Synthesis of Mn doped Bi₂S₃ Photocatalyst for Efficient Degradation of Organic Dye under Visible-Light Irradiation. *Journal of Molecular Structure*, 133598. <https://doi.org/10.1016/j.molstruc.2022.133598>
- Shad. S**, Bashir. N, and Lynch. I, (2021). Incorporation of biogenic zinc nanoparticles in a polymeric membrane: potential impact on the mineralization of organic herbicides. *Cleaner Engineering, and Technology*. <https://doi.org/10.1016/j.clet.2021.100339>.
- Shad. S**, Belinga-Nault. M.F.A.D, Sohail, Bashir. N, Lynch. I, (2020). Removal of contaminants from canal water using microwave synthesized zero-valent iron nanoparticles, *Environmental Science: Water Research & Technology*, <https://doi.org/10.1039/D0EW00157K>
- Sohail, U. Amara. **Shad, S.**, N. Ilyas, A. Manaf, N. I. Raja, Z. R. Mashwani 2018. In vitro Germination and Biochemical Profiling of Brassica napus in Response to Biosynthesized Zinc Nanoparticles: *IET Nanobiotechnology*, 9pp, ISSN 1751-8741 <https://doi.org/10.1049/iet-nbt.2018.5012>
- Anwar, J, H.U. Shah, R. Ali, Z. Iqbal, S. Khan, S. Rehman, **Shad. S**, Sohail. (2015). Antioxidant Activity and Phytochemical Screening of Stem Bark Extracts of *Grewia Optiva* Drummond EX Burret. *Journal of Pharmacognosy and Phytochemistry*; 3(6): 179-182. 19.
- Ali, R., H.U. Shah, J. Anwar, **Shad, S.** and Sohail. (2015). Phytochemical Screening and Antioxidant Activity of Stem Extracts of *Zizyphus oxyphylla* EDGEW. *American Eurasian Journal of Agriculture and Environmental Science*. 15 (5): 832-836, 2015. <https://doi.org/10.5829/idosi.aejaes.2015.15.5.12584>.
- Shad, S.**, N. Tanoli, Q.A. Jadoon. (2015). Analysis of Pesticides in Vegetables, Degradation, and its Side Effects: A Review Paper. *American-Eurasian Journal of Agriculture & Environmental Sciences*. 15 (1): 24-28. <https://doi.org/10.5829/idosi.aejaes.2015.15.1.12475>

- > Royal Chemical Society (RCS)
- > American Chemical Society (ACS)
- > Nano Hybrids and Composites (NHC)
- > Journal of Nano Research (JNanoR)
- > Annals of Chemical Science Research
- > Bio sight Journal

EDITORIAL MEMBER

- > Nano Trends-A Journal of Nano Technology & Its Applications
- > Journal of Hydrology & Water Resources



Book Chapter Published (2025)

■ **The Role of Artificial Intelligence in Pharmaceutical Biotechnology**

Nadeem, T., **Shad, S.**, Aslam, S., Bashir, H., Wagi, S., Mehwish, S., & Khan, S. (2025). Pharmaceutical Biotechnology. 190. <https://doi.org/10.1201/9781003633976-17>



Awards/ Honors

- > 2021-2025 Co-operative Member of Board of Studies (BOS)
- > 2021-2025 Focal Person for Student's Financial Aid and Scholarship
- > 2023- Organizer "A Hands-on workshop on ChemDraw and Origin-Pro: Visualizing Chemical Structures and Data Analysis"
- > 2023- selected as member of Editorial Committee in a Nano Trends-A Journal of Nano Technology & Its Applications
- > 2023- selected as member of Editorial Committee in an Academic Journal of Hydrology & Water Resources
- > Higher Education Commission (HEC) Islamabad, Pakistan approved Ph.D. Supervisor.
- > 2021–2022 - Recently completed the training for the National Faculty Development Program (NFDP) at the National Academy of Higher Education (NAHE) Pakistan and was selected as IPFP-Fellow by Higher Education Commission, Islamabad Pakistan to serve at the Department of Chemistry, The University of Haripur, and Haripur KP Pakistan.
- > 2018 - International Research Support Initiative Program (IRSIP), 6 months Research Fellowship offered by the Higher Education Commission (HEC) of Pakistan at the School of Geography, Earth and Environmental Sciences, University of Birmingham, the United Kingdom.



REFERENCES

- **Prof. Dr. Nadia Bashir**
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