

Curriculum Vitae

Dr. Muhammad Ehsan Mazhar

Associate Professor (Tenured)

Institute of Physics

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Date of Birth: 15th March 1984

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EDUCATION

- **PhD in “Materials for Engineering”:** Università degli Studi di Brescia (University of Brescia), Italy. (January 2012 to February 2015)
Thesis Title: P-type Metal Oxide Nanomaterials for Workfunction Chemical Sensing.
Advisor: Prof. Dr. Guido Faglia
- **M. Phil Physics:** Bahauddin Zakariya University Multan, Pakistan. Session 2007-09
Thesis Title: Synthesis and Characterization of Nanoscale MgAl_2O_4 , doped with K^{1+} ions.
Advisor: Prof. Dr. Javed Ahmad
- **Bachelor of Science in Physics:** Bahauddin Zakariya University Multan. Session 2003- 07.

RESEARCH INTERESTS

Synthesis of Nanomaterials, Structural, Electrical and Morphological Characterizations for Sensing and other electronic Applications.

EXPERIENCE

- **Associate Professor (Tenured) at Institute of Physics Bahauddin Zakariya University Multan, Pakistan** (March 19th 2022 to date)
- **Assistant Professor at Department of Physics, Bahauddin Zakariya University Multan, Pakistan** (Since 6th May 2015- March 18th 2022).
- **M.Phil Theses Supervised:** 40 Theses completed. Research was mainly related to Hydrothermal Synthesis and Characterization of Semiconducting Nanomaterial's and Electronic Applications.
- **Doctor of Philosophy (PhD).** SENSOR Laboratory, University of Brescia, Italy. January 2012-March 2015. Synthesis and Characterization of metal oxide nanomaterials for detecting various hazardous gases by Conductometric gas sensing and Kelvin-probe gas sensing techniques.
- **M.Phil (Physics).** Synthesis and characterization of nanoscale magnesium aluminates by coprecipitation methods and their structural and optical characterizations. (2007-10)

SCIENTIFIC EXPERTIES

Synthesis of Oxide Nanomaterials by various methods
Electrochemical Sensing
Electrochemistry and Applications

Languages

English (Fluent)
Urdu (Native)

ACADEMIC EXPERIENCE

Have taught several 4-5 courses (every Semester) to students at university level since 2015. Currently Teaching courses related to Solid State Physics, Electronics and Experimental Techniques to BS, MSc & M.Phil classes.

Other Academic Responsibilities

- President, Zakariyan Alumni Association of Physicists (ZAAP) BZU Multan.
- Coordinator M.Phil Program
- Member Board of Studies (BOS) Institute of Physics, BZU Multan
- Member/ Secretary: Committee for re-structuring/ up-gradation of the Department of Physics
- Departmental Focal Person to DQE (Director Quality Enhancement)
- Member: Departmental Welfare Committee
- Member; Departmental Library Committee
- Member; Departmental Horticulture Committee
- Member; Teaching Laboratory-III
- Member; Board of Studies in Aviation Sciences
- Deputy Director Student Affairs

RESEARCH GRANTS

- Start-up Research Grant (SRGP) September 2015 (HEC)
- Synthesis and Characterization of Semiconducting Metal Oxides for Electronic Applications. (Bahauddin Zakariya University)
- Hydrothermal Synthesis and Characterization of pure and doped metal oxide nanomaterials for potentially high-performance electronics.

PUBLICATIONS

2023

1. Hydrothermally Synthesized Pure and Mn-Doped ZnS/ZnO Nanoparticles as Potential Candidate in Capacitive Devices Muhammad Ehsan Mazhar, Muhammad Usman Tahir, Javed Ahmad, Qura Tul Ain, Gideon F. B. Solre, Kamran Qadir, Waseem Abbas, Bandar Ali Al-Asbahi, Sana Ullah Asif, Sadia Malik, Journal of Electronic Materials

2. Identification of pyrrolizidine alkaloids and flavonoid glycosides through HR-LCMS/MS analysis, biological screening, DFT and molecular docking studies on *Heliotropium dasycarpum* Ledeb. *Arabian Journal of Chemistry*, Volume 16, Issue 5, May 2023, 104655.

Few Other Articles are submitted...

2022

3. Cyclophosphazene intrinsically derived heteroatoms (S, N, P, O) doped carbon nanoplates for ultrasensitive monitoring of dopamine from chicken samples. *Biosensors* 2022, 12, 1106.
4. Structural, dielectric, and magnetic properties of $\text{CaBaCo}_{2-x}\text{Zn}_x\text{Nd}_y\text{Fe}_{12-y}\text{O}_{22}$ Y-type hexaferrites, Muhammad Nadeem, Hasan M. Khan, Saeed Ahmad Buzdar, Javed Ahmed, Mohammed A. Assiri, Muhammad Imran, Mohammad Ehsan Mazhar, Mehrun Nisa, Mohammad Ehsan Raza, Benish Raza, and Mohammad Jamshed, *Journal of Material Science: Materials in Electronics*, (<https://doi.org/10.1007/s10854-022-07804-x>).
5. Tuning magnetic properties in the Ce–Al Co-substituted M-type BaSr (6:4) hexaferrites A. R. Makhdoom, Fahim Ahmed, Ubaid-ur-Rehman Ghor, Qasim Ali Ranjha, Komal Ali Rao, Asim Javed, Muhammad Ehsan Mazhar, Mehak Bukhari, Asghari Maqsood, Sana Ullah Asif, and Muhammad Wasim Khan, *Journal of Material Science: Materials in Electronics*, (<https://doi.org/10.1007/s10854-022-07915-5>).
6. Enhanced Optical Transmittance of Silver Nanowires via Gamma Rays Irradiation, Shehla Honey, Hasan M. Khan, Muhammad Ehsan Mazhar, Javed Ahmad, Hassan Raza, Ishaq Ahmad, Jamil Asim, Shahzad Naseem, M. Maaza, *Journal of King Saud University – Science* 34 (2022) 102058.
7. Study of the Electrical Properties and Electrochemical Sensing Efficiency of Hydrothermally Synthesized Sr Doped Nickel Oxide Nanomaterials, Waseem Abbas, Muhammad Ehsan Mazhar, Javed Ahmad, Sohail Ahmad, Hassan M. Khan, Imran Khan, Imran Zada, Shehla Honey, Mehrun Nisa, Komal Ali Rao and Mushtaq Ahmad, *Physica Scripta* 97 (2022) 075004
8. Chemodiversity, Biological Activities and Molecular Docking Studies of *Leptadenia pyrotechnica* (Forssk.) Decne: A Comprehensive Approach to Validate Its Medicinal Use, Momina Zubair, Mamona Nazir, Muhammad Saleem, Naheed Raiz, Saba Touseef, Saima Khan, Gokhan Zengin, Muhammad Ehsan Mazhar, and Muhammad Imran Tousif, *Chemistry and Biodiversity*, 2022, 19, e202100884

2021

9. Enhanced structural and electrical properties of Ca-Ba Rare earth substituted M –type hexaferrites, H. M. Khan, S. Mumtaz, A. Waheed, J. Ahmad, M. E. Mazhar*, W. Abbas,

- I. Khan, M. N. Usmani, S. Bakhtawar, A. Javed, G. A. Ashraf, S. Ahmad, R. Naz, S. Ahmad. Journal of Ovonic Research Vol. 17, No. 2, March - April 2021, p. 165 – 173.
10. Structural, morphological, dielectric and magnetic properties of $\text{Ba}_{1-x}\text{Cr}_x\text{Fe}_{12}\text{O}_{19}$ M type hexaferrites, Muhammad Zahid, Hasan M. Khan, Aziz Ur Rehman, Abdul Waheed, Imran Sadiq, Ehsan Mazhar, Mohammed A. Assiri, Muhammad Imran, Muhammad Inam Ur Rehman¹ and Mujahid Mustaqeem, Physica Scripta 96 (2021) 125405.
 11. Strain tuning of the Curie temperature and valley polarization in two dimensional ferromagnetic $\text{WSe}_2/\text{CrSnSe}_3$ heterostructure, Nanotechnology 32 (2021) 375708 (8pp).
 12. Structural and magnetic variations in $\text{Ba}_{0.5}\text{Sr}_{0.5}\text{Fe}_9\text{Ce}_1\text{Al}_2\text{O}_{19}$ hexaferrites at different sintering temperatures, A R Makhdoom,¹ Qasim Ali Ranjha, Ubaid-ur-Rehman Ghori, Muhammad Ahsan Raza, Binish Raza, Muhammad Ehsan Mazhar, Komal Ali Rao, Fahim Ahmed, Sana Ullah Asif, Muhammad Wasim Khan and Mehrun Nisa. Physica Scripta, 96 125865.
 13. Improved Electrical Properties of Hydrothermally Synthesized Pure and Fe Doped Nanocrystalline $\text{La}_2\text{Mo}_2\text{O}_9$, Muhammad Ehsan Mazhar*, Muhammad Bilal, Abdul Waheed, Javed Ahmad, Imran Khan ,Waseem Abbas, Naeem Akhtar, Asim Javed, Muhammad Nauman Usmani* , Hassan Mahmood, Arfa Riaz and Mehek Bukhari, Physica Scripta, 96 (2021) 125822.
 14. Facile synthesis and characterizations of Co^{2+} doped $\text{Bi}_{0.8}\text{Ba}_{0.2}\text{FeO}_3$ nano-crystalline multiferroic ceramics, Muhammad Qadeer Awan, Javed Ahmad, Abdul Waheed, Syed Ali Raza Gillani, Fahim Ahmed, Sana Ullah Asif, Muhammad Ehsan Mazhar and Shafiq Anwar, Physica Scripta, 96 (2021) 105805.
 15. Influence of beam energy of ions on properties of nickel nanowires, Shehla Honey, Jamil Asim, Kaviyarasu Kasinathan, Maaza Malik, Shahzad Naseem, Muhammad Ahsan Mazhar, Hassan Mehmood, Muhammad Arshad Kamran, Ishaq Ahmad and Tingkai Zhao, Surface Review and Letters, Published on 28 December 2021.
 16. Structural Elucidation, Morphological Properties, and Dielectric Properties of Nickel-Substituted Cobalt and Lead-Based X-Type Hexagonal Ferrites, Muhammad Wajad, Hasan M. Khan, Abdul Waheed, Muhammad Zahid, Muhammad Misbah Ur Rehman, Mohammad Hussein, Muhammad Ehsan Mazhar, Muhammad Nauman Usmani, and Muhammad Imran Khan, Journal of Materials Engineering and Performance. Accepted: 30 September 2021, <https://doi.org/10.1007/s11665-021-06353-4>.
 17. Structural Elucidation with Improved Dielectric and Magnetic Properties of Sol–Gel Synthesized Cr^{3+} Substituted M-Type Sr^{2+} Hexaferrites, Muhammad Zahid, Hasan M. Khan, Imran Sadiq, Aziz Ur Rehman, Abdul Waheed, Ehsan Mazhar, Mohammed A. Assiri, Muhammad Imran, Nauman Usmani, and Imran Khan, Journal of Materials Engineering and Performance, 29 September 2021. <https://doi.org/10.1007/s11665-021-06263-5>.

18. Synthesis and Sensing Efficiency of CN Wrapped ZnFe₂O₄ Microspheres-Ionic Liquid Composite Towards Ultra-High Sensitivity Arsenic (III) Monitoring of Ground Drinking Water, Awais Siddique Saleemi, Muhammad Hafeez, Aqsa Munawar, Naeem Akhtar, Waseem Abbas, Muhammad Ehsan Mazhar, Zahid Shafiq, Anthony P. Davis, Shern-Long Lee, Issue 37, 2020, Journal of Materials Chemistry C.
19. Synthesis and Characterization of Rare Earth Substituted M -Type (Sr-Ba) Hexaferrites, Journal of Ovonic Research Vol. 16, No. 5, September - October 2020, p. 281 – 291. H. M. Khan, Z. Mirrani, A. Waheed, J. Ahmad, M. E. Mazhar*, M. N. Usmani, I. Syed, S. Bakhtawar, I. Ahmad, W. Abbas, R.Naz, S. Ahmad, M. Mahmood
20. Electrochemical Sensing of H₂O₂ by Hydrothermally Synthesized Pure Copper Oxide Materials, M. E. Mazhar, R. Asif, A. Waheed, J. Ahmad, M. N. Usmani*, I. Syed, H. M. Khan, Digest Journal of Nanomaterials and Biostructures, Vol. 15, No. 4, October-December 2020, p.1239-1245.

2019

21. Insight into the structural characterization of Pure and Zr-doped hydrothermally synthesized Cerium Oxide nanoparticles, Mazhar, Muhammad Ehsan; Bakhtawar, Samia; Manzoor, Anwar; Usmani, Muhammad; Abbas, Waseem; Ahmad, Javed; Akhtar, Naeem; Khan, Khalil. Accepted Manuscript online 13 March 2019 Materials Research Express.
22. Impact of Silver Dopant on Electrical and Dielectric Properties of ZnO Nanoparticles, Irshad Ahmad, M. Ehsan Mazhar, M. Nauman Usmani, Khalil Khan, Sajjad Ahmad, Javed Ahmad, Journal of Material Research Express 6 (2019) 035014.
23. Auto-Combustion Facile Synthesis and Photocatalytic Hydrogen Evolution Activity of Al and Ni Co-Doped ZnO Nanoparticles, I. Ahmad, M. E. Mazhar, M. N. Usmani*, K. Khan, S. Ahmad, J. Ahmad, Journal of Ovonic Research, Volume 15, Number 1, January-February 2019.
24. Auto-combustion synthesis of pure and Er, Dy co-doped ZnO nanomaterials for efficient methyl orange degradation using solar and visible light photocatalysis. Irshad Ahmad, Muhammad Ehsan Mazhar, Muhammad Nauman Usmani, Mohsin Mehmood, Waseem Hashmi, Naeem Akhtar, Ijaz Ahmed. 17 April 2019, Materials Research Express.
25. Growth and Characterization Of 4H-SiC by Thermal Evaporation Method, Muhammad Irfan, Muhammad Ajmal, Muhammad Ehsan Mazhar*, Muhammad Nauman Usmani, Mudassar Hussain, Sajjad Ahmad, Waseem Abbas, Digest Journal of Nanomaterials and Biostructures, Volume 14, No. 1, January - March 2019.
26. Effect of Dy-Co on physical and magnetic properties of X-type hexaferrites (Ba_{2-x}Dy_xCu₂Fe_{28-y}Co_yO₄₆). Sana Ullah Asif, Shaukat Rizwan, Muhammad Qadeer Awan, Muhammad Wasim Khan, Imran Sadiq, Muhammad Ehsan Mazhar, Ashfaq Ahmad, S. Sajjad Hussain, Ehsan Ullah Khan, Wanbiao Hua, Muhammad Naeem Ashiq, Chinese Journal of Physics 61 (2019) 47-54.
27. Electrochemical Determination of urinary dopamine from neuroblastoma patients based on Cu nanoplates encapsulated by alginate-derived carbon, Waseem Abbas, Qinglei Liu,

Naeem Akhtar, Javed Ahmad, Muhammad Ehsan Mazhar, Tengfei Lia, Imran Zada, Lulu Yao, Raheela Naz, Muhammad Imtiaz, Wang Zhang, Ali Amjad, Di Zhanga, Jiajun Gu, Journal of Electroanalytical Chemistry Volume 853, 15 November 2019, 113560.

2018

28. Influence of post deposition thermal annealing on the optical characteristics of Hafnia Nanofilms, A. Javed, M. F. Wasiq, M. Rana, M. Y. Nadeem, N. A. Niaz, M. E. Mazhar, M. N. Usmani, R. Ciancio, P. Orgiani, Journal of Ovonic Research vol. 14, no. 2, March - April 2018, p. 101 – 112.
29. Dielectric and impedance spectroscopy of K^{+1} doped $MgAl_2O_4$ nanoparticles, Javed Ahmad, M. Qadeer Awan, Roomana Yasmin, Maria Sabir, Shaq Anwar, M. Ehsan Mazhar and Syed Hamad Bukhari, International Journal of Modern Physics B (2018).
30. Facilely green synthesis of 3D nano-pyramids Cu/Carbon hybrid sensor electrode materials for simultaneous monitoring of phenolic compounds, Waseem Abbas, Naeem Akhtar, Qinglei Liu, Tengfei Lia, Imran Zada, Lulu Yao, Raheela Naz, Wang Zhang, Muhammad Ehsan Mazhar, Di Zhang, Dongling Ma, Jiajun Gu, Sensors and Actuators B: Chemical, Accepted 21 November 2018, Volume 282, 1 March 2019, Pages 617-625.
31. Synthesis, Characterization and Photocatalytic Performance Investigation of Nickel Doped ZnO Nanoparticles, I. Ahmad, M. Ehsan Mazhar, M. Nauman Usmani, K. Khan, S. Ahmad, J. Ahmad, Digest Journal of Nanomaterials and Biostructures Vol. 13, No. 4, October-December 2018, 1149-1157.

2017

32. Atmospheric Pressure Glow Discharge (APGD) Plasma Generation and Surface Modification of Aluminum and Silicon Si (100), Muhammad Tufiq Jamil, Javed Ahmad, Syed Hamad Bukhari, Muhammad Ehsan Mazhar, Umair Nissar, Ateeq Jamil Rao, Hammad Ahmad, Ghulam Murtaza, Digest Journal of Nanomaterials and Biostructures Vol. 12, No. 2, April - June 2017, p. 595 – 604.
33. Effect of Co^{2+} substitution on $MgAl_2O_4$ studied by infrared reflectance spectroscopy, Javed Ahmad, Maria Sabir, M. Qadeer Awan, Shafiq Anwar, M. Ehsan Mazhar, R. Arif Khalil, Syed Hamad Bukhari, Optik 147 (2017) 180–186.
34. Infrared reflectance spectroscopy of $MgAl_2O_4$, nanoparticles substituted by K^{+} ions, Javed Ahmad, M. Qadeer Awan, Roomana Yasmin, Maria Sabir, Shafiq Anwar, M. Ehsan Mazhar and Syed Hamad Bukhari, International Journal of Modern Physics B, Vol. 32 (2017) 1850067.

2016 and earlier (during MS and PhD)

35. Kelvin probe as an effective tool to develop sensitive p-type CuO gas sensors, M. E. Mazhar, G. Faglia, E. Comini, D. Zappa, C. Baratto, G. Sberveglieri, Sensors and Actuators B 222 (2016) 1257–1263.
36. Conductance and work function of TiO_2 nanotubes-based gas sensors, Galstyan, Vardan, Comini, Elisabetta, Baratto, Camilla, Mazhar, Muhammad Ehsan, Ponzoni, Andrea, Sberveglieri, Veronica, Poli, Nicola, Faglia, Guido, Sberveglieri Giorgio, Oral

Presentation in EUROSENSORS 2015 Conference. Procedia Engineering 120 (2015) 769 – 772.

37. P-type CuO nanowires and thin film for highly sensitive kelvin probe gas sensing applications, M. E. Mazhar, G. Faglia, C. Baratto, E. Comini, D. Zappa, R. Kumar, G. Sberveglieri, Procedia Engineering, Volume 87, 2014, Pages 16–19.
38. Effect of substitution of K^+ ions on the structural and electrical properties of nanocrystalline $MgAl_2O_4$ spinel oxide, J. Ahmad, M. E. Mazhar, M. Q. Awan, M. N. Aashiq, Physica B: Physics of Condensed Matter 406 (2011), pp. 3484-3488.
39. Effect of substitution of Co^{2+} ions on the structural and electrical properties of nanosized magnesium aluminate. J. Ahmad, M. Q. Awan, M. E. Mazhar, M. N. Aashiq, Physica B; Condensed Matter, vol. 406, page 254- 258.

CONFERENCE PRESENTATIONS/ PARTICIPATION

- Organized and Lecture Presentation at 1st Internal Conference on Advanced Nanomaterials University of Okara, Pakistan, October 2nd to 4th, 2023.
- IRCBMs (Interdisciplinary Research Centre in Biomedical Materials) 5th Dental and Biomaterials Summer Camp 29 July to 02 August 2019, Lahore, Pakistan.
- 1st International Conference on Strongly Corelated Electron Systems and Nanotechnology, Poster Presentation, 15-17 January 2019. The Women University Multan, Pakistan. (Poster Presentation)
- Two Days Training Workshop: Understanding Endnote and Nvivo, Research Made Easy. Department of Physics, Bahauddin Zakariya University 10-11 May 2017.
- Training Workshop on XRD, FT-IR & LUMO FT-IR Microscope, AIOU Islamabad, 7-9 Dec. 2017.
- EUROSENSORS, September 7-10 (2014), Brescia, Italy (Delivered a Lecture Presentation)
- INO Annual Symposium, 1-3 October 2014, Sezione INO Sensor Lab, Brescia.Via Branze 38 Brescia, Italy.
- AISEM 2013 Brescia, Italy University and CNR Campus, (on February 5-7, 2013)
- International School of Physics and Technology of Matter (Otranto, Italy, September 2013)

Awards

- PhD Fully Funded Scholarship of Università degli Studi di Brescia 2012-2015.
- HEC Indigenous Scholar scholarship for M. Phil leading to PhD.
- I am being awarded with Annual as well as Performance Based Increments every year since induction.

References

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