Engr. Dr. Muhammad Aftab Akram

Assistant professor (Department of Materials Science & Engineering)
PAF-IAST, Mang (Haripur)
Aftab.akram@fcm3.paf-iast.edu.pk
Contact # Office Contact No# 0995-933200
https://scholar.google.com/citations?user=xdWFyZcAAAAJ&hl=en

Education

- 2017: PhD in Materials and Surface Engineering, School of Chemical and Materials Engineering (SCME), National University of Sciences and Technology (NUST) Pakistan
- 2010: MS in Materials and Surface Engineering, School of Chemical and Materials Engineering, National University of Sciences and Technology (NUST), Islamabad, Pakistan
- 2008: B.Sc. Engg. (honors) in Metallurgical and Materials Engineering, Department of Metallurgical and Materials Engineering, University of Engineering and Technology (UET) Lahore, Pakistan.

Experience

1: Teaching Experience:

- June 2021 – Present
  Head of Department
  Department of Materials Science & Engineering, Pak-Austria Fachhochschule: Institute of Applied Sciences and Technology, (PAF-IAST) Mang, Khanpur Road, Haripur-KPK, Pakistan
- Feb 2022 – May 2022
  Associate Professor
  Department of Materials Engineering, School of Chemical and Materials Engineering (SCME), National University of Sciences and Technology (NUST) Pakistan
- 2017 – 2022
  Assistant Professor
  Department of Materials Engineering, School of Chemical and Materials Engineering (SCME), National University of Sciences and Technology (NUST) Pakistan

Projects & Awards

1. **Projects:**

   - HEC NRPU Project #9998 Fabrication Characterization and Testing of Nanostructured Devices for Efficient Energy Storage and Conversion [13.2 Million PKR]
   - HEC SRGP Project#1768 “Fabrication and Characterization of 2 Dimensional Materials for Energy Storage Devices” [0.5 Million PKR Completed]
   - RAC-IV Project “ZnO Nanostructure for UV and Gas Sensing Applications” [0.1 Million PKR Completed]
   - RAC-VI Project “Flexible Conductive Materials Development for EMI Shielding [0.25 M Completed]”
   - RAC-VII Project “Design and Development of an EMI shield for Cable” [0.25 M Completed]
   - RAC-IX Project “Carbon Fiber Reinforced Epoxy Based Structural Energy Storage Composites” [1.0 M PKR]
   - Industrial Project “Development of Tungsten Chromium Hard Coatings via Electroplating” [0.5 M PKR]

2. **Awards:**

   - **Best Researcher Award (2018-19),** School of Chemical and Materials Engineering (SCME), National University of Sciences and Technology (NUST) Pakistan
   - **Presidential Gold Medal** (Best in Academics), 7th PG Convocation National University of Sciences and Technology (NUST) Pakistan
   - **Outstanding Reviewer Certificate (September 2017) [Elsevier],** Applied Surface Science [Impact

Factor: 6.707]

- **Appreciation Certificate** for performance in research at NUST from 2019 to 2021
- **Mega S&T Fellowship,** National University of Sciences and Technology (NUST) Pakistan for MS leading to PhD

3. **Memberships:**

- American Chemical Society (ACS) [#32342944]
- The Minerals, Metals & Materials Society (TMS) [#484375]

Patent & Publications

65 International Publications in ISI indexed journals, cumulative impact factor of 3**00+**, citations 1200+, *h*-index **20**: https://scholar.google.com/citations?user=xdWFyZcAAAAJ&hl=en

[1] A.A. Qureshi, S. Javed, M.A. Akram, L. Schmidt-Mende, A.J.A.O. Fakharuddin, Solvent-Assisted Crystallization of an α-Fe2O3 Electron Transport Layer for Efficient and Stable Perovskite Solar Cells Featuring Negligible Hysteresis, ACS Omega 8(20) (2023) 18106-18115.

[2] M.N. Kiani, M.S. Butt, I.H. Gul, M. Saleem, M. Irfan, A.H. Baluch, M.A. Akram, M.A. Raza, Synthesis and Characterization of Cobalt-Doped Ferrites for Biomedical Applications, ACS Omega 8(4) (2023) 3755-3761.

[3] M.Z. Khan, I.H. Gul, M.M. Baig, M.A. Akram, Facile synthesis of a multifunctional ternary SnO2/MWCNTs/PANI nanocomposite: Detailed analysis of dielectric, electrochemical, and water splitting applications, Electrochim. Acta 441 (2023) 141816.

[4] G. Jalani, M. Rizwan, M. Akram, M.J.F.B.B. Mujahid, Editorial: Cell and therapeutic delivery using injectable hydrogels for tissue engineering applications, Front Bioeng Biotechnol 11 (2023) 1170933.

[5] M.U. Iqbal, Sumayya, S. Butt, M.U. Farooq, S. Hussain, S. Irfan, N. Ali, M.A. Basit, M.A. Akram, M. Yasir, A. Hassan, Thermoelectric transportation in Cu-added Ca3Co4O9 ceramics consolidated by spark plasma sintering, Physica B: Condensed Matter 654 (2023).

[6] J. Zhu, Z. Liu, P. Hu, M. Guo, Y. Li, J. Li, M.A. Akram, M. Wei, Grain Boundary Passivation Using D131 Organic Dye Molecule for Efficient and Thermally Stable Perovskite Solar Cells, ACS Sustainable Chemistry & Engineering 10(41) (2022) 13825-13834.

[7] H.M. Sajid, H. Afzal, M. Irfan, M. Saleem, R. Jan, S. Javed, M.A.J.A.O. Akram, Design of Multilayered 2D Nanomaterial Composite Structures for EMI Shielding Analysis, ACS Omega 7(40) (2022) 35586-35594.

[8] M.R. Rehman, M.A. Akram, I.H. Gul, Improved Electrical Properties of Strontium Hexaferrite Nanoparticles by Co2+ Substitutions, ACS Omega 7(48) (2022) 43432-43439.

[9] A. Rehman, Z. Jahan, F. Sher, T. Noor, M.B. Khan Niazi, M.A. Akram, E.K. Sher, Cellulose acetate based sustainable nanostructured membranes for environmental remediation, Chemosphere 307 (2022) 135736.

[10] M. Rabeel, S. Javed, R. Khan, M.A. Akram, S. Rehman, D.-k. Kim, M.F.J.M. Khan, Controlling the Wettability of ZnO Thin Films by Spray Pyrolysis for Photocatalytic Applications, Materials (Basel) 15(9) (2022) 3364.

[11] A.A. Qureshi, S. Javed, H.M.A. Javed, M. Jamshaid, U. Ali, M.A.J.N. Akram, Systematic Investigation of Structural, Morphological, Thermal, Optoelectronic, and Magnetic Properties of High-Purity Hematite/Magnetite Nanoparticles for Optoelectronics, Nanomaterials 12(10) (2022) 1635.

[12] Z. Masroor, U. Ali, M.A. Akram, M.A. Basit, Investigating the physicochemical response of CdS quantum-dots deposition over SiO2-incorporated TiO2 photoanodes for solar cells, Colloids Surf. Physicochem. Eng. Aspects 636 (2022) 128131.

[13] M.T. Masood, A. Safdar, M.A. Akram, S. Javed, S. Qudsia, The Potential Effect of Annealing Mesostructured Titanium Dioxide Electrode in a Closed Box Furnace on the Concentration of Lead (II) Iodide Solution Required for Optimal Performance of Mesoscopic Perovskite Solar Cells, Crystals 12(6) (2022) 833.

[14] R. Khan, M.T. Mehran, S.R. Naqvi, A.H. Khoja, M.M. Baig, M.A. Akram, F. Shahzad, S. Hussain, A highly efficient A-site deficient perovskite interlaced within two dimensional MXene nanosheets as an active electrocatalyst for hydrogen production, Int. J. Hydrogen Energy 47(88) (2022) 37476-37489.

[15] Y. Khalid, A. Achour, M.A. Akram, M. Islam, Polycarbonate/Titania Composites Incorporating TiO2 with Different Nanoscale Morphologies for Enhanced Environmental Stress Cracking Resistance in Dioctyl Phthalate, Polymers 14(17) (2022) 3693.

[16] H.M.A. Javed, M. Adnan, A.A. Qureshi, S. Javed, M. Adeel, M.A. Akram, M. Shahid, M. Irfan Ahmad, M. Afzaal, H.S.M. Abd-Rabboh, M. Arif, Morphological, structural, thermal and optical properties of Zn/Mg-doped TiO2 nanostructures for optoelectronic applications, Optics & Laser Technology 146 (2022) 107566.
[17] N. Arshad, M. Usman, M. Adnan, M.T. Ahsan, M.R. Rehman, S. Javed, Z. Ali, M.A. Akram, G.P. Demopoulos, A. Mahmood, Nanoengineering of NiO/MnO(2)/GO Ternary Composite for Use in High-Energy Storage Asymmetric Supercapacitor and Oxygen Evolution Reaction (OER), Nanomaterials (Basel) 13(1) (2022) 99.
[18] Z. Ali, M. Ali, A. Mehmood, A. Ishfaq, M.A. Akram, A. Zeb, X. Lin, Nano-architectured cobalt selenide spheres anchored on graphene oxide sheets for sodium ion battery anode, Frontiers in Materials 9 (2022).
[19] M. Ali, M.T. Ahsan, A. Mehmood, A. Ishfaq, G. Ali, M.A. Akram, S. Javed, Z. Ali, MOF-Derived AlCuSe2 Embedded in a Carbon Matrix for an Economical Anode of Lithium-Ion Battery, ACS Omega 7(34) (2022) 30440-30446.
[20] A. Akram, M.A. Liaqat, S. Javed, M. Hamid, U. Ali, F. Javed, M. Wei, M.A. Akram, Ultrahigh performance asymmetric supercapacitor devices with synergetic interaction between metal organic frameworks/graphene nano platelets and redox additive electrolyte, J. Alloys Compd. 891 (2022) 161961.
[21] M. Adnan, M. Usman, S. Ali, S. Javed, M. Islam, M.A. Akram, Aluminum Doping Effects on Interface Depletion Width of Low Temperature Processed ZnO Electron Transport Layer-Based Perovskite Solar Cells, Front Chem 9 (2022) 795291.
[22] S.A. Abbasi, J. Iqbal, M. Rashid, M.A. Akram, N. Rehman, M.A. Basit, Wet-chemical decoration of SiO2 spheres with TiO2 particles for enhanced dye degradation and solar cell performance, Opt. Mater. 126 (2022) 112207.
[23] M. Usman, M.T. Ahsan, S. Javed, Z. Ali, Y. Zhan, I. Ahmed, S. Butt, M. Islam, A. Mahmood, M.A. Akram, Facile synthesis of iron nickel cobalt ternary oxide (FNCO) mesoporous nanowires as electrode material for supercapacitor application, Journal of Materiomics (2021).
[24] M. Usman, M. Adnan, M.T. Ahsan, S. Javed, M.S. Butt, M.A. Akram, In Situ Synthesis of a Polyaniline/ Fe-Ni Codoped Co3O4 Composite for the Electrode Material of Supercapacitors with Improved Cyclic Stability, ACS Omega 6(2) (2021) 1190-1196.
[25] A.A. Qureshi, S. Javed, H.M.A. Javed, A. Akram, M.S. Mustafa, U. Ali, M.Z. Nisar, Facile formation of SnO2–TiO2 based photoanode and Fe3O4@rGO based counter electrode for efficient dye-sensitized solar cells, Mater. Sci. Semicond. Process. 123 (2021).
[26] A.A. Qureshi, H.M.A. Javed, S. Javed, A. Bashir, M. Usman, A. Akram, M.I. Ahmad, U. Ali, M. Shahid, M. Rizwan, S.A. Raza, Incorporation of Zr-doped TiO2 nanoparticles in electron transport layer for efficient planar perovskite solar cells, Surfaces and Interfaces 25 (2021) 101299.
[27] R. Khan, M.T. Mehran, S.R. Naqvi, A.H. Khoja, M.M. Baig, M.A. Akram, F. Shahzad, S. Hussain, A highly efficient A-site deficient perovskite interlaced within two dimensional MXene nanosheets as an active electrocatalyst for hydrogen production, Int. J. Hydrogen Energy (2021).
[28] M.M. Butt, T.F. Khan, M. Muhyuddin, M.A. Akram, M.Z. Ansar, M.A. Basit, S. Butt, Outlining the beneficial photocatalytic effect of ZnS deposition in simplistically developed iron oxide nanocomposites of different stoichiometry, Appl. Phys. A 127(4) (2021) 251.
[29] M.S. Akhtar, I.H. Gul, M.M. Baig, M.A. Akram, Binder-free pseudocapacitive nickel cobalt sulfide/MWCNTs hybrid electrode directly grown on nickel foam for high rate supercapacitors, Materials Science and Engineering: B 264 (2021) 114898.
[30] M. Adnan, M. Usman, M.A. Akram, S. Javed, S. Ali, I. Ahmad, M. Islam, Study of magnetic and dielectric properties of ZnFe2O4/CoCr2O4 nanocomposites produced using sol-gel and hydrothermal processes, J. Alloys Compd. 865 (2021) 158953.
[31] M. Usman, M. Adnan, S. Ali, S. Javed, M.A. Akram, Preparation and Characterization of PANI@NiO Visible Light Photocatalyst for Wastewater Treatment, ChemistrySelect 5(40) (2020) 12618-12623.
[32] Z. Shi, X. Zhang, J. Guo, X. Li, Z. Weng, F. Liu, L. Wu, I. Ahmed, A. Akram, S. Javed, G. Xing, F. Li, Y. Zhan, L. Zheng, (TASiW-12)-Modified SnO2 Electron Transport Layer for Efficient and Stable Perovskite Solar Cells, Solar RRL 4(11) (2020).
[33] A.A. Qureshi, S. Javed, H.M. Asif Javed, A. Akram, M. Jamshaid, A. Shaheen, Strategic design of Cu/TiO2-based photoanode and rGO-Fe3O4-based counter electrode for optimized plasmonic dye-sensitized solar cells, Opt. Mater. 109 (2020) 110267.
[34] M. Muhyuddin, T.F. Khan, M.A. Akram, I. Ali, T.J. Park, M.A. Basit, Significantly improved photo- and electro-chemical performance of CuS.PbS nanocomposites for dye degradation and paintable counter electrodes, J. Photochem. Photobiol. A: Chem. 400 (2020) 112720.

[35] A. Mahmood, Z. Ali, H. Tabassum, A. Akram, W. Aftab, R. Ali, M.W. Khan, S. Loomba, A. Alluqmani, M. Adil Riaz, M. Yousaf, N. Mahmood, Carbon Fibers Embedded With Iron Selenide (Fe 3 Se 4) as Anode for High-Performance Sodium and Potassium Ion Batteries, Front Chem 8 (2020) 408.
[36] M.A. Liaqat, Z. Hussain, Z. Khan, M.A. Akram, A. Shuja, Effects of Ag doping on compact TiO2 thin films synthesized via one-step sol–gel route and deposited by spin coating technique, Journal of Materials Science: Materials in Electronics 31(9) (2020) 7172-7181.
[37] M. Guo, D. Shen, Y. Li, M.A. Akram, M. Wei, TiO2 Mesocrystals Processed at Low Temperature as the Electron-Transport Material in Perovskite Solar Cells, ChemSusChem 13(19) (2020) 5256-5263.
[38] M.U. Farooq, R. Jan, M. Azeem, M.A. Umer, M.A. Akram, A.N. Khan, I. Ahmad, S.A. Khan, Z.A. Umar, U. Liaqat, Enhanced mechanical properties of functionalized BN nanosheets-polymer composites, Journal of Polymer Research 27(10) (2020) 1-9.
[39] F. Altaf, M.B.K. Niazi, Z. Jahan, T. Ahmad, M.A. Akram, A. safdar, M.S. Butt, T. Noor, F. Sher, Synthesis and Characterization of PVA/Starch Hydrogel Membranes Incorporating Essential Oils Aimed to be Used in Wound Dressing Applications, J. Polym. Environ. (2020).
[40] M.T. Ahsan, M. Usman, Z. Ali, S. Javed, R. Ali, M.U. Farooq, M.A. Akram, A. Mahmood, 3D Hierarchically Mesoporous Zinc-Nickel-Cobalt Ternary Oxide (Zn0.6Ni0.8Co1.6O4) Nanowires for High-Performance Asymmetric Supercapacitors, Front Chem 8(487) (2020) 487.
[41] I. Ahmed, R. Jan, A.N. Khan, I.H. Gul, R. Khan, S. Javed, M.A. Akram, A. Shafqat, H.M. Cheema, I. Ahmad, Graphene-ferrites interaction for enhanced EMI shielding effectiveness of hybrid polymer composites, Materials Research Express 7(1) (2020) 016304.
[42] M.K. Tariq, A. Riaz, R. Khan, A. Wajid, H.-u. Haq, S. Javed, M.A. Akram, M. Islam, Comparative study of Ag, Sn or Zn doped TiO2 thin films for photocatalytic degradation of methylene blue and methyl orange, Materials Research Express 6(10) (2019).
[43] M.F. Shakir, A.N. Khan, R. Khan, S. Javed, A. Tariq, M. Azeem, A. Riaz, A. Shafqat, H.M. Cheema, M.A. Akram, I. Ahmad, R. Jan, EMI shielding properties of polymer blends with inclusion of graphene nano platelets, Results in Physics 14 (2019) 102365.
[44] A. Sana, I. Malik, M. Mujahid, M.A. Akram, M. Adeel Umer, Surface degradation study of magnesium tested in simulated body fluid, Bio-Med. Mater. Eng. 30(3) (2019) 341-348.
[45] A. Riaz, A. Ashraf, H. Taimoor, S. Javed, M.A. Akram, M. Islam, M. Mujahid, I. Ahmad, K. Saeed, Photocatalytic and Photostability Behavior of Ag- and/or Al-Doped ZnO Films in Methylene Blue and Rhodamine B Under UV-C Irradiation, Coatings 9(3) (2019) 202.
[46] H.M. Naeem, M. Muhyuddin, R. Rasheed, A. Noor, M.A. Akram, M.N. Aashiq, M.A. Basit, Simplistic wet-chemical coalescence of ZnO with Al2O3 and SnO2 for enhanced photocatalytic and electrochemical performance, Journal of Materials Science: Materials in Electronics 30(15) (2019) 14508-14518.
[47] M. Muhyuddin, M.T. Ahsan, I. Ali, T.F. Khan, M.A. Akram, M.A. Basit, A new insight into solar paint concept: regeneration of CuS nanoparticles for paintable counter electrodes in QDSSCs, Appl. Phys. A 125(10) (2019) 716.
[48] F. Mughal, M. Muhyuddin, M. Rashid, T. Ahmed, M.A. Akram, M.A. Basit, Multiple energy applications of quantum-dot sensitized TiO2/PbS/CdS and TiO2/CdS/PbS hierarchical nanocomposites synthesized via p-SILAR technique, Chem. Phys. Lett. 717 (2019) 69-76.
[49] R. Khan, A. Riaz, M. Rabeel, S. Javed, R. Jan, M.A. Akram, TiO2@NbSe2 decorated nanocomposites for efficient visible-light photocatalysis, Applied Nanoscience 9(8) (2019) 1915-1924.
[50] A. Achour, M. Islam, S. Vizireanu, I. Ahmad, M.A. Akram, K. Saeed, G. Dinescu, J.J. Pireaux, Orange/Red Photoluminescence Enhancement Upon SF6 Plasma Treatment of Vertically Aligned ZnO Nanorods, Nanomaterials (Basel) 9(5) (2019) 794.
[51] F. Javed, S. Javed, M.A. Akram, M. Mujahid, M. Islam, A.S. Bhatti, Surface plasmon mediated optical properties of ZnO/Au/TiO2 nanoheterostructure rod arrays, Materials Science and Engineering: B 231 (2018) 32-39.
[52] M. Islam, Y. Khalid, I. Ahmad, A.A. Almajid, A. Achour, T.J. Dunn, A. Akram, S. Anwar, Microstructural Evaluation of Inductively Sintered Aluminum Matrix Nanocomposites Reinforced with Silicon Carbide and/or Graphene Nanoplatelets for Tribological Applications, MMTA 49(7) (2018) 2963-2976.
[53] R. Jan, A. Habib, M.A. Akram, I. Ahmad, A. Shah, M. Sadiq, A. Hussain, Flexible, thin films of graphene–polymer composites for EMI shielding, Materials Research Express 4(3) (2017) 035605.

[54] A. Safdar, M. Islam, M.A. Akram, M. Mujahid, Y. Khalid, S.I. Shah, Reaction Time and Film Thickness Effects on Phase Formation and Optical Properties of Solution Processed Cu2ZnSnS4 Thin Films, J. Mater. Eng. Perform. 25(2) (2016) 457-465.
[55] A. Safdar, M. Islam, I. Ahmad, A. Akram, M. Mujahid, Y. Khalid, Y. Zhu, Quantum confinement and size effects in Cu 2 ZnSnS 4 thin films produced using solution processed ultrafine nanoparticles, Mater. Sci. Semicond. Process. 41 (2016) 420-427.
[56] R. Jan, A. Habib, M.A. Akram, T.U. Zia, A.N. Khan, Uniaxial Drawing of Graphene-PVA Nanocomposites: Improvement in Mechanical Characteristics via Strain-Induced Exfoliation of Graphene, Nanoscale Res Lett 11(1) (2016) 377.
[57] M. Aftab Akram, S. Javed, M. Islam, M. Mujahid, A. Safdar, Arrays of CZTS sensitized ZnO/ZnS and ZnO/ZnSe core/shell nanorods for liquid junction nanowire solar cells, Sol. Energy Mater. Sol. Cells 146 (2016) 121-128.
[58] M.U. Shahid, K.M. Deen, A. Ahmad, M.A. Akram, M. Aslam, W. Akhtar, Formation of Al-doped ZnO thin films on glass by sol–gel process and characterization, Applied Nanoscience 6(2) (2015) 235-241.
[59] M.A. Akram, S. Javed, J. Xu, M. Mujahid, C.-S. Lee, Arrays of ZnO/CuInxGa1−xSe2 nanocables with tunable shell composition for efficient photovoltaics, J. Appl. Phys. 117(20) (2015) 205306.
[60] M. Khan, M. Islam, A. Akram, Z. Qi, L. Li, Residual strain and electrical resistivity dependence of molybdenum films on DC plasma magnetron sputtering conditions, Mater. Sci. Semicond. Process. 27 (2014) 343-351.
[61] S. Javed, M.A. Akram, M. Mujahid, Environment friendly template-free microwave synthesis of submicron-sized hierarchical titania nanostructures and their application in photovoltaics, CrystEngComm 16(48) (2014) 10937-10942.
[62] S. Salam, M. Islam, A. Akram, Sol–gel synthesis of intrinsic and aluminum-doped zinc oxide thin films as transparent conducting oxides for thin film solar cells, Thin Solid Films 529 (2013) 242-247.
[63] M. Khan, M. Islam, A. Akram, U. Manzoor, Processing–Structure–Property Correlation in Dc Sputtered Molybdenum Thin Films, Surf. Rev. Lett. 20(06) (2013) 1350065.
[64] R. Nazir, N. Iqbal, A.S. Khan, A. Akram, A. Asif, A.A. Chaudhry, I.u. Rehman, R. Hussain, Rapid synthesis of thermally stable hydroxyapaptite, Ceram. Int. 38(1) (2012) 457-462.
[65] N. Iqbal, R. Nazir, A. Asif, A.A. Chaudhry, M. Akram, G.Y. Fan, A. Akram, R. Amin, S.H. Park, R. Hussain, Electrophoretic deposition of PVA coated hydroxyapatite on 316L stainless steel, CAP 12(3) (2012) 755-759.