Dr. Hussain Alawadhi

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Education

- Ph.D., Physics (Experimental Condensed Matter), Purdue University (West Lafayette, USA), December 1999. Thesis title: Modulation Spectroscopy of III-V and II-VI Semiconductors and Their Heterostructures
- M.Sc., Physics, Purdue University (West Lafayette, USA), May 1993.
- B.Sc., Physics and Mathematics, Iowa State University (Ames, USA), December 1988.

Work Experience

- 2016-present: Director of Center for Advanced Materials Research
- 2012-2015: Director of the X-Ray Center for Material Analysis
- 2004-2008 and 2013/14: Chairman of Applied Physics Department, U. of Sharjah
- 2012-present: Associate Professor, U. of Sharjah
- 2009-2012: Coordinator of the National X-ray Fluorescence Lab, U. of Sharjah
- 2000-2012: Assistant Professor, University of Sharjah
- June 2010: Visiting Scientist, University of Western Ontario (Canada)
- Summers of 2000-2012: Visiting Scientist, Purdue University (USA)
- 2001-2008: Physics Labs Coordinator, University of Sharjah

Knowledge and Skills

- Design and setup of optical systems and modulation techniques.
- Practical knowledge of polishing, etching, and surface preparation of II-VI semiconductors.
- Spectroscopic characterization techniques such as Photoluminescence, Xray Fluorescence, Raman spectroscopy, and Xray diffraction.
- Measurement of optical and intrinsic properties of semiconductors.
- Experience in working with laser systems, spectrometers, low level signal detection using lock-in amplifiers, detectors (UV, visible, IR), vacuum systems, Xray diffraction systems, cryostats, XRF systems, Raman systems, and cryogenic liquids.
- Experience in Linux, FORTRAN, C, Maple, and LabVIEW.

Patents:

A. Elwakil, A. Alagui, S. Majzoub, and **H. Alawadhi;** *Atmospheric Pressure Air Microplasma System for True Random Bit Generation*. Both US & International patents granted (April 2021).

Publications in Refereed Journals (last 5 years)

1. N. M. Hamdan, **H. Alawadhi**, N. Jisrawi, M. Shameer; *Size resolved analysis of fine and ultrafine fractions of indoor particulate matter using energy dispersive X-ray fluorescence and electron microscopy*; X-ray Spectrometry **47 (1)**; pp 72-78 (2018).

2. A. H. Alami, M. A. Assad, K. Aokal, B. Rajab, **H. Alawadhi**; *Assessment of Photoelectrode Material Based on* $(TiO_2)_{1-x}/(Al_{65}Cu_{24}Fe_{11})_x$ *in Dye-Sensitized Solar Cell Applications*; Material Science Forum **928**, p 94-99 (2018).

3. F. M. Khan, E. Saleh, **H. Alawadhi**, R. Harati, W. Zimmermann, and R. El-Awady; *Inhibition of exosome release by ketotifenenhances sensitivity of cancer cells to doxorubicin*; Cancer Biology & Therapy **19 (1)**, pp 25-33 (2018).

4. Z. A. Darwish, H. A. Kazem, K. Sopian, M. A. Alghoul, **H. Alawadhi**; *Experimental investigation of dust pollutants and the impact of environmental parameters on PV performance: an experimental study*; Environment, Development and Sustainability **20 (1)**, pp 155-174 (2018).

5. I. Ahmad, M. Islam, N. H. Alharthi, **H. Alawadhi**, T. Subhani, K. S. Munir, S. I. Shah, F. Inam, and Y. Zhu; *Chemical and structural analyses of the graphene nanosheet/alumina ceramic interfacial region in repidly consolidated ceramic nanocomposites*; Journal of Composite Materials **52 (3)**; pp 417-428 (2018).

6. M. A. Abdelkareem, Y. Al Haj, M. Alajami, **H. Alawadhi**, N. Barakat; *Ni-Cd carbon nanofibers as an effective catalyst for urea fuel cell*; Journal of environmental chemical engineering **6 (1)**, pp 332-337 (2018).

7. N. M. Hamdan, **H. Alawadhi**, N. Jisrawi, M. Shameer; *Characterization of Fine Particulate Matter in Sharjah, United Arab Emirates Using Complementary Experimental Techniques*; Sustainability **10 (4)**, 1088 (2018).

8. A. E. Rojas, A. Allagui, A. S. Elwakil, **H. Alawadhi**; *True random bit generators based on current time series of contact glow discharge electrolysis*; Journal of Applied Physics **123 (20)**, pp 203301 (2018).

9. Z. Said, A. Allagui, M. Ali Abdelkareem, **H. Alawadhi**, K.Elsaid; *Acid-functionalized carbon nanofibers for high stability, thermoelectrical and electrochemical properties of nanofluids*; Journal of Colloid Interface Science **520**, pp 50-57 (2018).

10. K. A. Mosa, M. El-Naggar, K. Ramamoorthy, **H. Alawadhi**, A. Elnaggar, S. Wartanian, E. Ibrahim and H. Hani; *Copper Nanoparticles Induced Genotoxicty, Oxidative Stress Genotoxicty, Oxidative Stress, and Changes in Superoxide Dismutase (SOD) Gene Expression in Cucumber (Cucumis Sativus) Plants*; Frontiers in Plant Science **9**, 872 (2018).

11. T. Jan, S. Azmat, B. Wahid, M. Adil, **H. Alawadhi**, Q. Mansoor, Z. Farooq, SZ Ilyas, I. Ahmad, M. Ismail; *Chemically synthesized ZnO-*Bi_2O_3 *(BZO) nanocomposites with tunable optical, photoluminescence and antibacterial characteristics*; Materials Science in Semiconductor Processing **84**, pp 71-75 (2018).

12. A. H. Alami, K. Aokal, A. Abu Hawili, R. Hasan, **H. Alawadhi**; *Facile preparation of graphene coated copper electrodes via centrifugal milling for capacitive deionization applications*; Desalination **446**, pp 51-58 (2018).

13. M. K. Hameed, I. M. Ahmady, **H. Alawadhi**, B. Workie, E. Sahle-Demessie, C. Han, M. M. Chehimi, A. A. Mohamed; *Gold-carbon nanoparticles mediated delivery of BSA: Remarkable robustness and hemocompatibility*; Colloids and Surfaces A **558**, pp 351-358 (2018).

14. A. A. Mohamed, S. N. Neal, B. Atallah, N. D. AlBab, **H. Alawadhi**, Y. Pajouhafsar, H. E. Abdou, B. Workie, E. Sahle-Demessie, C. Han, M. Monge, J. M. Lopez-de-Luzuriaga, J. H. Reibenspies, M. M. Chehimi; *Synthesis of gold organometallics at the nanoscale*; Journal of Organometallic Chemistry **877**, pp 1-11 (2018).

15. D. Zhang, A. Taieb, A. H. Alami, K. Aokal, **H. Alawadhi**, J. Abed, L. Bichara; *A cost-effective nanoparticle-gap-film SERS sensor using graphene nanospacer by one-step transfer-free mechanical milling*; Journal of Applied Physics **125 (6)**, 063102 (2019).

16. E. T. Sayed, T. Eisa, H. O. Mohamed, M. A. Abdelkareem, A. Allagui, **H. Alawadhi**, K. Chae; *Direct urea fuel cells: Challenges and opportunities*; Journal of Power Sources **417**, pp 159-175 (2019).

17. Z. Said, A. Allagui, M. A. Abdelkareem, A. S. Elwakil, **H. Alawadhi**, R. Zannerni, K. Elsaid; *Modulating the energy storage of supercapacitors by mixing close-to-ideal and far-from-ideal capacitive carbon nanofibers*; Electrochimica Acta **301**, pp 465-471 (2019).

18. A. H. Alami, B. Rajab, J. Abed, M. Faraj, A. Abu Hawili, **H. Alawadhi**; *Investigating various copper oxides-based counter electrodes for dye sensitized solar cell applications*; Energy **174**, pp 526-533 (2019).

19. M. Egilmez, N.M. Hamdan, **H. Alawadhi**, M.S. AlGhabra, D. Prabhakarian; *Probing the Subtle Magnetic Transitions with Raman Spectroscopy in a Bi-layered* $La_{1.15}Sr_{1.85}Mn_2O_7$ *Single Crystal*; Journal of Superconductivity and Novel Magnetism **32 (12)**, pp 3939-3945 (2019).

20. M. A. Ali, K. A. Mosa, A. El-Keblawy, **H. Alawadhi**; *Exogenous Production of Silver Nanoparticles by Tephrosia apollinea Living Plants under Drought Stress and Their Antimicrobial Activities*; Nanomaterials **9 (12)**; p 1716 (2019).

21. N. Hamdan, **H. Alawadhi**, M. Shameer; *SEM/EDS as Complementary Techniques to XRD and XRF for Structural Determination of Particulate Matter Pollution*; Microscopy and Microanalysis **26 (S2)**, 990-992 (2020).

22. A. G. Al-Nuairi, K. A. Mosa, M. G. Mohammad, A. El-Keblawy, S. Soliman, **H. Alawadhi**; *Biosynthesis, Characterization, and Evaluation of the Cytotoxic Effects of Biologically Synthesized Silver Nanoparticles from Cyperus conglomeratus Root Extracts on Breast Cancer Cell Line MCF-7*; Biological Trace Element Research **194**, pp 560–569 (2020).

23. I. Musa, N. Qamhieh, K. Said, S.T. Mahmoud, **H. Alawadhi**; *Fabrication and characterization of aluminum nitride nanoparticles by RF magnetron sputtering and inert gas condensation technique*; Coatings **10 (4)**; p 411 (2020).

24. K. Daoudi, M. Gaidi, **H. Alawadhi**, S. Columbus, D. Zhang, A. Allagui, M. Shameer, A. Taieb; *Structural effects of silver-nanoprism-decorated Si nanowires on surface-enhanced Raman scattering*; Nanotechnology **31 (25)**; 255706 (2020).

25. N. M. Hamdan, **H. Alawadhi**; *X-ray diffraction as a major tool for the analysis of PM2.5and PM10aerosols*; Powder Diffraction **35 (2)**; pp 98-103 (2020).

26. M.A. Abdelkareem, E.T. Sayed, **H. Alawadhi**, A.H. Alami; *Synthesis and testing of cobalt leaf-like nanomaterials as an active catalyst for ethanol oxidation*; International Journal of Hydrogen Energy **45 (35)**, 17311-17319 (2020).

27. E. T. Sayed, **H. Alawadhi**, K. Elsaid, A. G. Olabi, M. Almakrani, S. Bin Tamim, G. Alafranji, M. A. Abdelkareem; *A Carbon-Cloth Anode Electroplated with Iron Nanostructure for Microbial Fuel Cell Operated with Real Wastewater*; Sustainability **12**, 6538 (2020).

28. E.T. Sayed, M.A. Abdelkareem, **H. Alawadhi**, T. Salameh, A.G. Olabi, A.H. Alami; *Facile and low-cost synthesis route for graphene deposition over cobalt dendrites for direct methanol fuel cell applications*; Journal of the Taiwan Institute of Chemical Engineers **115**, 321-330 (2020).

29. **H. Alawadhi**, M.A. Abdelkareem, N. Hussain, T. Wilberforce, E.T. Sayed; *A composite of graphitic carbon nitride and Vulcan carbon as an effective catalyst support for Ni in direct urea cells*; Journal of the Taiwan Institute of Chemical Engineers **116**, 160-168 (2020).

30. A. Allagui, A.S. Elwakil, A.E. Rojas, S. Majzoub, **H. Alawadhi**; *Parallel random bit streams from a single source of entropy based on nonthermal electrochemical microplasma*; Plasma Processes and Polymers **17 (12)**, 2000123 (2020).

31. A. Allagui, S. Majzoub, A.S. Elwakil, A.E. Rojas, **H. Alawadhi**; *Atmospheric pressure air microplasma current time series for true random bit generation*; Scientific reports **10 (1)**, 1-10 (2020).

32. S. A. Aravindh, I.S. Roqan, **H. Alawadhi**; *Density Functional Theory Studies of* $Zn_{12}O_{12}$ *Clusters Doped with Mg/Eu and Defect Complexes*; Journal of Cluster Science 55; pp 55-62 (2021).

33. A. Iqbal, M. S. Mahmoud, E. T. Sayed, K. Elsaid, M. A. Abdelkareem, **H. Alawadhi**, A.G. Olabi; *Evaluation of the nanofluid-assisted desalination through solar stills in the last decade*; Journal of Environmental Management **277**, 111415 (2021).

34. M. Al Radi, E.T. Sayed, **H. Alawadhi**, M.A. Abdelkareem; *Progress in energy recovery and graphene usage in capacitive deionization*; Critical Reviews in Environmental Science and Technology, 1-57 (2021).

35. N. Hussain, M.A. Abdelkareem, **H. Alawadhi**, A. Alaswad, E.T. Sayed; *Two dimensional Cu based nanocomposite materials for direct urea fuel cell*; International Journal of Hydrogen Energy **46 (8)**, 6051-6060 (2021).

36. E. T. Sayed, **H. Alawadhi**, A.G. Olabi, A. Jamal, M. S. Almahdi, J. Khalid, M. A. Abdelkareem; *Electrophoretic deposition of graphene oxide on carbon brush as bioanode for microbial fuel cell operated with real wastewater*; International Journal of Hydrogen Energy **46 (8)**, 5975-5983 (2021).

37. N. Hamdan, **H. Alawadhi**, M. Shameer; *Characterization of $PM_{2.5}$ at a Traffic Site Using Several Integrated Analytical Techniques*; X-Ray Spectrometry **50 (2)**, 106-120 (2021).

38. E. T. Sayed, M. A. Abdelkareem, **H. Alawadhi**, K. Elsaid, T. Wilberforce, A.G. Olabi; *Graphitic carbon nitride/carbon brush composite as a novel anode for yeast-based microbial fuel cells*; Energy **221**, 119849 (2021).

39. N.M. Hamdan, **H. Alawadhi**, M. Shameer; *Physicochemical Characterizationand Seasonal Variations of PM_{10}Aerosols in a Harsh Environment*; Environmental Science **9**, 666678 (2021).

40. M. A. Abdelkareem, M. A. Lootah, E. T. Sayed, T. Wilberforce, **H. Alawadhi**, B. A.A. Yousef, A.G. Olabi; *Fuel cells for carbon capture applications*; Science of the Total Environment **769**, 144243 (2021).

41. N. Hussain, **H. Alawadhi**, S.M.A. Rahman, M.A. Abdelkareem; *Facile synthesis of novel Cu_2O-g-C_3N_4/Vulcan carbon composite as anode material with enhanced electrochemical performances in urea fuel cell*; Sustainable Energy Technologies and Assessments **45**, 101107 (2021).

42. E. T. Sayed, M. Al Radi, A. Ahmad, M. A. Abdelkareem, **H. Alawadhi**, M. A. Atieh, A.G. Olabi; *Faradic capacitive deionization (FCDI) for desalination and ion removal from wastewater*; Chemosphere **275**, 130001 (2021).

43. E.T. Sayed, M.A. Abdelkareem, **H. Alawadhi**, A.G. Olabi; *Enhancing the performance of direct urea fuel cells using Co dendrites*; Applied Surface Science **555**, 149698 (2021).

44. E. T. Sayed, M. A. Abdelkareem, A. Bahaa, T. Eisa, **H. Alawadhi**, S. Al-Asheh, K. Chae, A.G. Olabi; *Synthesis and performance evaluation of various metal chalcogenides as active anodes for direct urea fuel cells*; Renewable and Sustainable Energy Reviews **150**, 111470 (2021).

45. K. Daoudi, K. Ramachandran, **H. Alawadhi**, R. Boukherroub, E. Dogheche, My A. El Khakani, M. Gaidi; *Ultra-sensitive and fast optical detection of the spike protein of the SARS-CoV-2 using AgNPs/SiNWs nanohybrid based sensors*; Surfaces and Interfaces **27**, 101454 (2021).

46. H. Alnaqbi, E. T. Sayed, S. Al-Asheh, A. Bahaa, **H. Alawadhi**, M. A. Abdelkareem; *Current progression in graphene-based membranes for low temperature fuel cells*; International Journal of Hydrogen Energy, (2022).

47. K. Daoudi, M. Gaidi, S. Columbus, M. Shameer, **H. Alawadhi**; *Hierarchically assembled silver nanoprism-graphene oxide-silicon nanowire arrays for ultrasensitive surface enhanced Raman spectroscopy sensing of atrazine*; Materials Science in Semiconductor Processing **138**, 106288 (2022).

48. N. Hussain, M. A. Abdelkareem, **H. Alawadhi**, A. H. Alami, K. Elsaid; *Cu_2O nanoparticles decorated with MoS_2 sheets for electrochemical reduction of CO_2 with enhanced efficiency*; Applied Physics A **128**, 131 (2022).

49. A. Bahaa, M. A. Abdelkareem, A. Y. Mohamed, P. A. Shinde, B. A. A. Yousef, E. T. Sayed, **H. Alawadhi**, K. J. Chae, S. Al-Asheh, AG. Olabi; *High energy storage quasi-solid-state supercapacitor enabled by metal chalcogenide nanowires and iron-based nitrogen-doped graphene nanostructures*; Journal of Colloid and Interface Science **608(1)**, pp 711-719 (2022).

50. E. A. Abou Neel, N. Khalifa, M. Awad, S. Soumya, **H. Alawadhi**; *Remineralization potential and biocompatibility of titanium dioxide-doped phosphate glasses*; Materials Letters **309**, 131456 (2022).

51. E. Pervaiz, M. Ali, M. A. Abbasi, T. Noor, Z. Said, **H. Alawadhi**; *Unfolding essence of nanoscience for improved water splitting hydrogen generation in the light of newly emergent nanocatalysts*; International Journal of Hydrogen Energy **47**, 26915 (2022).

52. A. Chatla, I. W. Almanssra, P. Kallem, M. A. Atieh, **H. Alawadhi**, V. Akula. F. Banat; *Dry (CO2) reforming of methane over zirconium promoted Ni-MgO mixed oxide catalyst: Effect of Zr addition*; Journal of CO2 Utilization **62**, 102082 (2022).

53. N. Hussain, M. A. Abdelkareem, **H. Alawadhi**, K. Elsaid, A. G. Olabi; *Synthesis of Cu-g-C3N4/MoS2 composite as a catalyst for electrochemical CO2 reduction to alcohols*; Chemical Engineering Science **258**, 117757 (2022).

54. M. A. Abdelkareem, Q. Abbas, M. Mouselly, **H. Alawadhi**, A. G. Olabi; *High-performance effective metal-organic frameworks for electrochemical applications*; Journal of Science: Advanced Materials and Devices **7**, 100465 (2022).

55. L. Jaber, I. Ihsanullah, I. W. Almanssra, S. Backer, A. Abushawish, A. Khalil, **H. Alawadhi**, A. Shanableh, M. A. Atieh, *Adsorptive Removal of Lead and Chromate Ions from Water by Using Iron-Doped Granular Activated Carbon Obtained from Coconut Shells*; Sustainability **14**, 10877 (2022).

56. A. Chatla, I. W. Almanassra, V. Kochkodan, T. Laoui, **H. Alawadhi,** M. A. Atieh; *Efficient Removal of Eriochrome Black T (EBT) Dye and Chromium (Cr) by Hydrotalcite-Derived Mg-Ca-Al Mixed Metal Oxide Composite*; Catalysts **12,** 1247 (2022).

57. A. Abushawish, I. W. Almanassra, S. Backer, L. Jaber, A. Khalil, M. A. Abdelkareem, E. T. Sayed, **H. Alawadhi**, A. Shanableh, M. A. Atieh; *High-efficiency removal of hexavalent chromium from contaminated water using nitrogen-doped activated carbon: kinetics and isotherm study*; Materials Chemistry and Physics **291**, 126758 (2022).

58. N. Hussain, M. A. Abdelkareem, **H. Alawadhi**, S. Begum, K. Elsaid, A. G. Olabi; *Novel ternary CuO–ZnO–MoS_2 composite material for electrochemical CO_2 reduction to alcohols*; Journal of Power Sources **549**, 232128 (2022).

59. A. Ali, P. A. Piatkowski, **H. Alawadhi**, A. Alnaser; *Reducing the Cut-In Voltage of a Silicon Carbide/p-Silicon Heterojunction Diode Using Femtosecond Laser Ablation*; ACS Applied Electronic Materials **4**, 6076 (2022).

60. P. Piatkowski, A. Ali, **H. Alawadhi**, A. Alnaser; *Simultaneous Carburization, Oxidation, and Nitridation of Titanium Surface Using Ablation by Femtosecond Laser in n-Heptane*; Advanced Engineering Materials **25**, 2201361 (2023).

61. M. Adil, A. G. Olabi, M. A. Abdelkareem, **H. Alawadhi**, A. Bahaa, K. Elsaid, C. Rodriguez; *In-situ grown metal-organic framework derived CoS-Mxene pseudocapacitive asymmetric supercapacitors*; Journal of Energy Storage **60**, 106537 (2023).

62. M. Pylnev, F. Santos, D. Zhang, **H. Alawadhi**, N. Tabet; *Compact TiO2 layer by UV-assisted TiBr4 chemical bath deposition for perovskite solar cells*; Material Science in Semiconductor Processing **161**, 107467 (2023).

63. A. Chatla, I. W. Almanassra, A. Abushwish, T. Laoui, **H. Alawadhi**, M. A. Atieh, N. Ghaffour; *Sulphate removal from aqueous solutions: State-of-the-art technologies and future research trends*; Desalination **558**, 116615 (2023).

64. N. Hussain, **H. Alawadhi**, A. G. Olabi, K. Elsaid, M. A. Abdelkareem; *Construction of Cu2O-g-C3N4/MoS2 composite material through the decoration of Cu2O nanoparticles onto the surface of two-dimensional g-C3N4/MoS2 heterostructure for their application in electrochemical hydrogen evolution*; Fuel **347**, 128416 (2023).