Dr. Imran Shakir

Highly qualified **Professor** and **Researcher** with progressive career leveraging extensive teaching experience at both college, university level and the knowledge of nano materials to support the academic achievement of each student. Provide a fundamental understanding of the microscopic underlying mechanisms in the ionic transport properties and the change in the electronic structure of state-of-the-art nanostructures. Serve as in expert in the research of rational design and synthesis of novel functional nanomaterials materials using vapor deposition and wet chemical methods. Successfully published over 130 articles within reputable journals and have established reputation as a passionate lecturer, managing the curriculum for courses such as Energy Conversion and Storage, Materials Characterization, Solid State Physics, Materials Science, and Physical for Chemical Engineers.

Further research interests include the following:

- Synthesis of single metal atoms catalyst (SACs) supported on nitrogen-doped carbons (M-N-Cs) for Highly Efficient Oxygen Evolution Catalysts.
- Development of a general strategy for the synthesis of holey graphene framework (HGF) composites with metal oxides and polymers for energy storage and conversion devices.
- The variation in the electronic bands of the catalyst for paradigm-shift to solar-based photocatalysis that could produce large economic and social benefits.

Education and Credentials

Ph.D. Physics, Functional Nanomaterials, Sungkyunkwan University, Korea, 2011

M.Phil. Physics, University of Agriculture, Faisalabad, Pakistan, 2005

M.Sc., Physics, University of Agriculture, Faisalabad, Pakistan, 2005

B.S., Physics & Math Govt., College of Science Faisalabad, Pakistan

Professional Experience

Assistant Professor, Sustainable Energy Technologies, College of Engineering, King Saud University, Kingdom of Saudi Arabia (2013-todate)

Lecturer, Interdisciplinary Research Center in Biomedical Materials, COMSATS Institute of Information Technology Lahore Pakistan (2007-2008)

Lecturer, Shahkot College of Commerce, Shahkot, Pakistan (2003-2007)

Instructed a diverse group of students to stimulate information interest and retention while invigorating classes through the use of new technologies and concepts. Taught a wide range of courses, including REEN 503, REEN 545, PHYS 371, PHYS 574, PHYS 476, and CHEM 103. Developed and presented weekly lectures, led discussion sections, graded assignments, maintained student records, and oversaw teaching assistants. Performed in-depth research studies, analyzed results, and presented both qualitative and quantitative data.

Continued…

Postdoctoral Research Fellow, Sungkyunkwan University, South Korea (2011-2013)

- Provide guidance and support to graduate students on course related matters and on different projects like flexible energy storage project.
- Attend departmental and faculty conventions and conferences and lead relevant meetings, where necessary, at university.
- Prepare and mark examination and assignments.
- Render services being a responsible member of faculty and other committees of University.
- Undertake research on various subjects under flexible energy storage area to complete the research project funded by SAMSUNG Korea.
- Collaborate with colleagues in setting course requirement and research work within university and SAMSUNG to perform efficiently and look ahead for future funding opportunities.

Select Funding Projects / Research Grants

- Development of Functional metal oxide nanomaterials for flexible energy storage devices (SAMSUNG, Korea, 0.5 Million USD, 2011-2013).
- Development of Novel Heterogeneous Recyclable Photocatalyst Materials for Kingdoms Industrial and Agricultural Wastewater Decontamination/Purification (NWWC, 0.1 Million USD, 2016-17).
- Synthesis of metal sulphides based nanomaterials by utilizing sulphur waste from the hydrocarbon industry in Saudi Arabia for energy storage devices (0.8 Million USD, 2014-2017).
- Design and fabrication of high-performance, flexible energy storage devices via the layer-by-layer assembly of graphene and ultra-thin metal hydroxide films deposited onto multiwall carbon nanotubes (0.7 Million USD, 2015-2017).
- Design and synthesis of 2-D materials for Energy Application (KSU with UCLA, 1 Million USD, 2015-2018)

Leadership Activities

- Group Leader of Energy Storage and Hydrogen Group at Sustainable Energy Technologies (SET), College of Engineering, King Saud University, Kingdom of Saudi Arabia (2013-2018).
- President and Chair, International Conference of Advances in Functional Materials (2015-2017).

Awards

- Best Research award of King Saud University, May, 2018.
- Research Productivity Award (RPA) by King Saud University, May, 2016.

- Best Teacher award of King Saud University, May, 2017.
- Zahid Ali, Imran Shakir, Jingling Liu and Dae Joon Kang, " Visible Light Photocatalytic Response from Mesoporous ZnO-TiO2 Core Shell Structure" The Korean Physical Society meeting (KPS Spring meeting), Korea, 2011.4.15 **(best paper award).**
- Imran Shakir, Muhammad Shahid and Dae Joon Kang, **"**Synthesis of Tin oxide/Lead Zirconate Titanate Core Shell Nanospheres for Unpresented Visible Light Photocatalysis" The Korean Physical Society meeting (KPS Spring meeting), Korea, 2010.4.21~23 **(best paper award).**
- The Seoul scholarship was awarded for excellent academic performance and outstanding research plan on 13th March 2009.

Science Dissemination Activities:

I have been continuously invited to be a reviewer for the following journals, which signify my international research standing.
(1) Nano Energy, (2) Appl. Surf. Sci., (3) Chemosphere, (4) Colloid Surface A, (5) Catal. Lett., (6) Chem. Mater**,** (7) Environ. Eng. Sci., (8) Environ. Sci. Technol., (9) Electrochim. Acta, (10) RSC Advances, (11) J. Phys. D. Appl. Phys., (12) J. Hazard. Mater., (13) J. Alloy.Comp., (14) Nano Lett., (15) J. Phys. Chem. A,B,C (16) Langmuir, (17) Sol. Energ. Mater. Sol. Cell., (18) Synthetic Met., (19) Spectrochim. Acta A, (20) J. Phys. Chem., (21) J. Mol. Catal, ., (22) Materials Letter, (23) Chem. Comm., (23) J. Mater. Chem.,

List of Publications:

Patent:

1. Kim, S.-m., K. Dae-Jun, S.-n. Cha, **I. Shakir** and Y.-J. Park (2014). Graphene-nanoparticle structure and method of manufacturing the same, US Patent App. 14/102,965.

Books and Chapters:

1. **S. Imran,** A. Zahid, R. Usman Ali, N. Ayman, S. Mansoor, A.-N. InasMuen, H. Rafaqat, K. DaeJoon, Nanostructured Materials for the Realization of Electrochemical Energy Storage and Conversion Devices: Status and Prospects, in: B. Mohamed, J.P. Davim (Eds.) Handbook of Research on Nanoscience, Nanotechnology, and Advanced Materials, IGI Global, Hershey, PA, USA, 2014, pp. 376-413.
2. **Imran Shakir,** Dae Joon Kang, Muhammad Shahid (2012) "Multifunctional Nano-Structures for Energy Storage Devices", published by: LAP Lambert Academic Publishing, ISBN: 978-3-8484-1683-7.

3. Muhammad Shahid, **Imran Shakir**, Dae Joon Kang (2012) "Synthesis of Metal Oxide Nanostructures via Facile Chemical Routes", published by: LAP Lambert Academic Publishing, ISBN: 978-3-8484-9662-4.

Journal Publications:

1. Fei, H., Dong, J., Wan, C., Zhao, Z., Xu, X., Lin, Z., Wang, Y., Liu, H., Zang, K., Luo, J., Zhao, S., Hu, W., Yan, W., **Shakir, I.,** Huang, Y., and Duan, X. (2018). Microwave-Assisted Rapid Synthesis of Graphene-Supported Single Atomic Metals. Advanced Materials, 1802146.

2. Bu, F., **Shakir, I.** & Xu, Y. (2018). 3D Graphene Composites for Efficient Electrochemical Energy Storage. Advanced Materials Interfaces, 1800468.
3. Yang, G., Chen, J., Xiao, P., Agboola, P. O., **Shakir, I.** & Xu, Y. 2018. Graphene anchored on Cu foam as a lithiophilic 3D current collector for a stable and dendrite-free lithium metal anode. Journal of Materials Chemistry A, 6, 9899-9905.
4. Ding, M., Zhong, G., Zhao, Z., Huang, Z., Li, M., Shiu, H.-Y., Liu, Y., **Shakir, I.,** Huang, Y. & Duan, X. 2018. On-Chip in Situ Monitoring of Competitive Interfacial Anionic Chemisorption as a Descriptor for Oxygen Reduction Kinetics. ACS central science, 4, 590-599.
5. Xiao, P., Bu, F., Zhao, R., Aly Aboud, M. F., **Shakir, I.,** & Xu, Y. (2018). Sub-5 nm Ultrasmall Metal–Organic Framework Nanocrystals for Highly Efficient Electrochemical Energy Storage. ACS nano 12 (4), 3947-3953
6. Yuan, L., Jian, O., Enbo, Z., Sungjoon, L., Mengning, D., Lei L., **Imran, S.,** Vincent G., Yu, H., and Xiangfeng, D. "Approaching Schottky-Mott limit in van der Waals metal– 2 semiconductor contacts". Nature, volume 557, pages 696–700 (2018).
7. Bu, F., Xiao, P., Chen, J., Aly Aboud, M. F., **Shakir, I.,** & Xu, Y. (2018). Rational design of three-dimensional graphene encapsulated core-shell FeS@carbon nanocomposite as a flexible high-performance anode for sodium-ion batteries. Journal of Materials Chemistry A 6 (15), 6414-6421.
8. Chen, W., Qiyuan, H., Udayabagya, H., Yuanyue, L., Enbo, Z., Zhaoyang, L., Hai, X., Xidong, D., Ziying, F., Rui, C., Nathan, O. W., Guojun, Y., Yun-Chiao, H., Hao, W., Hung-Chieh, C., **Imran, S.,** Lei, L., Xianhui, C., William, A. G., Yu. H. and Xiangfeng, D., (2018). "Monolayer atomic crystal molecular superlattices". Nature 555, 231–236.
9. Huang, Y., K. Li, G. Yang, M. F. A. Aboud, **I. Shakir** and Y. Xu (2018). "Ultrathin Nitrogen-Doped Carbon Layer Uniformly Supported on Graphene Frameworks as Ultrahigh-Capacity Anode for Lithium-Ion Full Battery." Small: Volume14, Issue13, March 27, 2018, 1703969.
10. Fei, H., J. Dong, Y. Feng, C. S. Allen, C. Wan, B. Volosskiy, M. Li, Z. Zhao, Y. Wang, H. Sun, An,P., Chen,W., Guo, Z., Lee, C., Chen, D., **Shakir, I.**, Liu, M., Hu, T., Li, Y., Angus I. K., Duan , X., and Huang, Y., (2018). "General synthesis and definitive structural identification of MN 4 C 4 single-atom catalysts with tunable electrocatalytic activities." Nature Catalysis 1(1): 63.

11. Nazim, S., Shahid, M., Warsi, M. F., Agboola, P. O., Khan, M. A. & **Shakir, I.** (2018). Fabrication of efficient electrode material: CoxZn1-xFe2O4-graphene nano-heterostructures for high-performance supercapacitors. Ceramics International.

12. Warsi, M. F., H. M. W. Tayyab, P. O. Agboola, S. Ahmad, M. A. Khan and **I. Shakir** (2018). "New La 1-x Tb x MnO 3 nanoparticles: Fabrication via wet chemical route for enhanced structural, electrical and dielectric parameters." Materials Research Express.

13. Li, K., Y. Huang, J. Liu, M. Sarfraz, P. O. Agboola, **I. Shakir** and Y. Xu (2018). "A three-dimensional graphene framework-enabled high-performance stretchable asymmetric supercapacitor." Journal of Materials Chemistry A. 6: 1802-1808

14. Sun, H., L. Mei, J. Liang, Z. Zhao, C. Lee, H. Fei, M. Ding, J. Lau, M. Li, C. Wang, Xu Xu, Hao, G., Papandrea1, B., **Shakir, I.,** Dunn, B., Huang, Y., and Duan, X., (2017). "Three-dimensional holey-graphene/niobia composite architectures for ultrahigh-rate energy storage." Science **356**(6338): 599-604.

15. Liu, Y., J. Guo, Q. He, H. Wu, H.-C. Cheng, M. Ding, **I. Shakir,** V. Gambin, Y. Huang and X. Duan (2017). "Vertical Charge Transport and Negative Transconductance in Multilayer Molybdenum Disulfides." Nano letters **17**(9): 5495-5501.

16. Jiang, T., F. Bu, X. Feng, **I. Shakir,** G. Hao and Y. Xu (2017). "Porous Fe2O3 nanoframeworks encapsulated within three-dimensional graphene as high-performance flexible anode for lithium-ion battery." ACS nano **11**(5): 5140-5147.

17. Huang, Y., K. Li, J. Liu, X. Zhong, X. Duan, **I. Shakir** and Y. Xu (2017). "Three-dimensional graphene/polyimide composite-derived flexible high-performance organic cathode for rechargeable lithium and sodium batteries." Journal of Materials Chemistry A **5**(6): 2710-2716.

18. Yang, Y., F. Bu, J. Liu, **I. Shakir** and Y. Xu (2017). "Mechanochemical synthesis of two-dimensional aromatic polyamides." Chemical Communications **53**(54): 7481-7484.

19. Bu, F., X. Feng, T. Jiang, **I. Shakir** and Y. Xu (2017). "Inside Cover: One Versatile Route to Three-Dimensional Graphene Wrapped Metal Cyanide Aerogels for Enhanced Sodium Ion Storage." Chemistry-A European Journal **23**(35): 8323-8323.

20. Abbas, M. K., M. A. Khan, F. Mushtaq, M. F. Warsi, M. Sher, **I. Shakir** and M. F. A. Aboud (2017). "Impact of Dy on structural, dielectric and magnetic properties of Li-Tb-nanoferrites synthesized by micro-emulsion method." Ceramics International **43**(7): 5524-5533.

21. Yang, G., F. Bu, Y. Huang, Y. Zhang, **I. Shakir** and Y. Xu (2017). "In Situ Growth and Wrapping of Aminoanthraquinone Nanowires in 3 D Graphene Framework as Foldable Organic Cathode for Lithium-Ion Batteries." ChemSusChem **10**(17): 3419-3426.

22. Zhang, Y., Y. Huang, G. Yang, F. Bu, K. Li, **I. Shakir** and Y. Xu (2017). "Dispersion–Assembly Approach to Synthesize Three-Dimensional Graphene/Polymer Composite Aerogel as a Powerful Organic Cathode for Rechargeable Li and Na Batteries." ACS applied materials & interfaces **9**(18): 15549-15556.

23. Sarfraz, M. and **I. Shakir** (2017). "Recent advances in layered double hydroxides as electrode materials for high-performance electrochemical energy storage devices." Journal of Energy Storage **13**: 103-122.

24. ABOUD, M., I. Ahmad, S. Arshad, S. Liaqat, Z. Gilani, Q. Nadeem and **I. Shakir** (2017) "THE EFFECT OF RARE EARTH Dy 3 IONS ON STRUCTURAL, DIELECTRIC AND

ELECTRICAL BEHAVIOR OF Ni0. 4Co0. 6DyyFe2-yO4 NANO-FERRITES SYNTHESIZED BY WET CHEMICAL APPROACH." Digest Journal of Nanomaterials and Biostructures Vol. 12, No. 1, p. 159 – 168.

25. Shahid, M., S. Shafi, M. F. A. Aboud, M. F. Warsi, M. Asghar and **I. Shakir** (2017). "Impacts of Co2+ and Gd3+ co-doping on structural, dielectric and magnetic properties of MnFe2O4 nanoparticles synthesized via micro-emulsion route." Ceramics International **43**(16): 14096-14100.

26. Ahmad, S., M. A. Khan, M. Sarfraz, A. ur Rehman, M. F. Warsi and **I. Shakir** (2017). "The impact of Yb and Co on structural, magnetic, electrical and photocatalytic behavior of nanocrystalline multiferroic BiFeO3 particles." Ceramics International **43**(18): 16880-16887.

27. Bashir, B., W. Shaheen, M. Asghar, M. F. Warsi, M. A. Khan, S. Haider, **I. Shakir** and M. Shahid (2017). "Copper doped manganese ferrites nanoparticles anchored on graphene nano-sheets for high performance energy storage applications." Journal of Alloys and Compounds **695**: 881-887.

28. Ahmad, S., F. Naseem, M. Shahid, **I. Shakir,** M. F. Aboud, M. Sarfraz, M. A. Khan, A. U. Rehman and M. F. Warsi (2017). "Visible light driven photocatalysis for water purification by highly crystalline multiferroic BiFeO3 nanoparticles synthesized via wet chemical route." DESALINATION AND WATER TREATMENT **85**: 282-290.

29. Ali, R., M. A. Khan, A. Manzoor, M. Shahid, S. Haider, A. S. Malik, M. Sher, **I. Shakir** and M. FarooqWarsi (2017). "Investigation of structural and magnetic properties of Zr-Co doped nickel ferrite nanomaterials." Journal of Magnetism and Magnetic Materials **429**: 142-147.

30. Hussan, M., A. Ghaffar, **I. Shakir,** M. Naz and Q. Naqvi (2017). "Effects of ferrite coating layer on PEMC sphere radar cross section." Optik-International Journal for Light and Electron Optics **142**: 376-384.

31. Warsi, M. F., Z. A. Gilani, N. F. Al-Khalli, M. Sarfraz, M. A. Khan, M. N. Anjum and I**. Shakir** (2017). "New LiNi0. 5PrxFe2− xO4 nanocrystallites: Synthesis via low cost route for fabrication of smart advanced technological devices." Ceramics International **43**(17): 14807-14812.

32. Aadil, M., W. Shaheen, M. F. Warsi, M. Shahid, M. A. Khan, Z. Ali, S. Haider and **I. Shakir** (2016). "Superior electrochemical activity of α-Fe2O3/rGO nanocomposite for advance energy storage devices." Journal of Alloys and Compounds **689**: 648-654.

33. Ahmed, A., R. Raza, M. S. Khalid, M. Saleem, F. Alvi, M. S. Javed, T. A. Sherazi, M. N. Akhtar, N. Akram, M. A. Ahmad, Asia, R., Javed, I., Amjad, A., Ullah, **Shakir, I.**, Khan, . and Zhu, B. (2016). "Highly efficient composite electrolyte for natural gas fed fuel cell." International Journal of Hydrogen Energy **41**(16): 6972-6979.

34. Ali, Z., M. Tahir, C. Cao, A. Mahmood, N. Mahmood, F. K. Butt, M. Tanveer, **I. Shakir,** M. Rizwan and F. Idrees (2016). "Solid waste for energy storage material as electrode of supercapacitors." Materials Letters **181**: 191-195.

35. Dilshad, M., S. Nazim, M. F. Warsi, M. Shahid, S. Naseem, S. Riaz, **I. Shakir,** S. Haider and M. A. Khan (2016). "Fabrication and characterization of Ni1+ x ZrxFe2− 2xO4 nanoparticles for potential applications in high frequency devices." Ceramics International **42**(14): 16359-16363.

36. Du, J., H. Wang, H. Chen, M. Yang, X. Lu, H. Guo, Z. Zhang, T. Shang, S. Xu, W. Li , P. Wang, **I. Shakir** (2016). "Synthesis and Enhanced Photocatalytic Activity of Black Porous Zr-doped TiO2 Monoliths." Nano **11**(06): 1650068.

37. Ghaffar, I., M. F. Warsi, M. Shahid and **I. Shakir** (2016). "Unprecedented photocatalytic activity of carbon coated/MoO3 core–shell nanoheterostructurs under visible light irradiation." Physica E: Low-dimensional Systems and Nanostructures **79**: 1-7.

38. Illahi, A., A. Ghaffar, **I. Shakir,** M. Ali, K. Ahmed, M. Naveed and Q. Naqvi (2016). "Electromagnetic scattering from cylinders of infinite length immersed in a complex conjugate medium." Optik-International Journal for Light and Electron Optics **127**(23): 11143-11150.

39. Irshad, M., K. Siraj, R. Raza, F. Javed, M. Ahsan, **I. Shakir** and M. S. Rafique (2016). "High performance of SDC and GDC core shell type composite electrolytes using methane as a fuel for low temperature SOFC." AIP Advances **6**(2): 025202.

40. Junaid, M., M. A. Khan, F. Iqbal, G. Murtaza, M. N. Akhtar, M. Ahmad, **I. Shakir** and M. F. Warsi (2016). "Structural, spectral, dielectric and magnetic properties of Tb–Dy doped Li-Ni nano-ferrites synthesized via micro-emulsion route." Journal of Magnetism and Magnetic Materials **419**: 338-344.

41. Kashif, M., A. Shafie, N. Yahya, M. N. Akhtar, S. A. Shahid and **I. Shakir** "A Novel Antenna Design for the Potential Application of Oil Recovery."

42. Khan, I., I. Sadiq, I. Ali, M. Najam-Ul-Haq, A. Shah, **I. Shakir** and M. N. Ashiq (2016). "Structural, electrical and magnetic study of Nd–Ni substituted W-type Hexaferrite." Journal of Magnetism and Magnetic Materials **397**: 6-10.

43. Liu, Y., J. Guo, Y. Wu, E. Zhu, N. O. Weiss, Q. He, H. Wu, H.-C. Cheng, Y. Xu and **I. Shakir** (2016). "Pushing the performance limit of sub-100 nm molybdenum disulfide transistors." Nano letters **16**(10): 6337-6342.

44. Liu, Y., J. Sheng, H. Wu, Q. He, H. C. Cheng, **I. Shakir,** Y. Huang and X. Duan (2016). "High-Current-Density Vertical-Tunneling Transistors from Graphene/Highly Doped Silicon Heterostructures." Advanced Materials **28**(21): 4120-4125.

45. Majeed, A., M. A. Khan, F. ur Raheem, A. Hussain, F. Iqbal, G. Murtaza, M. N. Akhtar, **I. Shakir** and M. F. Warsi (2016). "Structural elucidation and magnetic behavior evaluation of rare earth (La, Nd, Gd, Tb, Dy) doped BaCoNi-X hexagonal nano-sized ferrites." Journal of Magnetism and Magnetic Materials **408**: 147-151.

46. Rasheed, A., M. Mahmood, U. Ali, M. Shahid, **I. Shakir,** S. Haider, M. A. Khan and M. F. Warsi (2016). "ZrxCo0. 8− xNi0. 2− xFe2O4-graphene nanocomposite for enhanced structural, dielectric and visible light photocatalytic applications." Ceramics International **42**(14): 15747-15755.

47. Rehman, J., M. A. Khan, A. Hussain, F. Iqbal, **I. Shakir,** G. Murtaza, M. N. Akhtar, G. Nasar and M. F. Warsi (2016). "Structural, magnetic and dielectric properties of terbium doped NiCoX strontium hexagonal nano-ferrites synthesized via micro-emulsion route." Ceramics International **42**(7): 9079-9085.

48. Shaheen, W., M. F. Warsi, M. Shahid, M. A. Khan, M. Asghar, Z. Ali, M. Sarfraz, H. Anwar, M. Nadeem and **I. Shakir** (2016). "Carbon coated MoO3 nanowires/graphene oxide ternary nanocomposite for high-performance supercapacitors." Electrochimica Acta **219**: 330-338.

49. **Shakir, I.,** M. Sarfraz, Z. Ali, M. F. Aboud and P. O. Agboola (2016). "Magnetically separable and recyclable graphene-MgFe2O4 nanocomposites for enhanced photocatalytic applications." Journal of Alloys and Compounds **660**: 450-455.

50. Sharif, M. K., M. A. Khan, A. Hussain, F. Iqbal, **I. Shakir,** G. Murtaza, M. N. Akhtar, M. Ahmad and M. F. Warsi (2016). "Synthesis and characterization of Zr and Mg doped BiFeO3 nanocrystalline multiferroics via micro emulsion route." Journal of Alloys and Compounds **667**: 329-340.

51. Yang, C., Z. Chen, **I. Shakir,** Y. Xu and H. Lu (2016). "Rational synthesis of carbon shell coated polyaniline/MoS 2 monolayer composites for high-performance supercapacitors." Nano Research **9**(4): 951-962.

52. Yang, G., Y. Zhang, Y. Huang, **I. Shakir** and Y. Xu (2016). "Incorporating conjugated carbonyl compounds into carbon nanomaterials as electrode materials for electrochemical energy storage." Physical Chemistry Chemical Physics **18**(46): 31361-31377.

53. Yaqoob, M., **I. Shakir,** A. Ghaffar, Y. Khan and Q. Naqvi (2016). "Transmission of electromagnetic wave from anisotropic plasma coated nihility circular cylinder." International Journal of Applied Electromagnetics and Mechanics **50**(1): 51-61.

54. Zhu, J., Y. Shan, T. Wang, H. Sun, Z. Zhao, L. Mei, Z. Fan, Z. Xu, **I. Shakir** and Y. Huang (2016). "A hyperaccumulation pathway to three-dimensional hierarchical porous nanocomposites for highly robust high-power electrodes." Nature communications **7**: 13432.

55. Ejaz, M., A. Mahmood, M. A. Khan, A. Hussain, A. Sultan, A. Mahmood, A. H. Chughtai, M. N. Ashiq, M. F. Warsi and **I. Shakir** (2016). "Influence of Yb3+ on the structural, dielectric and magnetic properties of Mg0. 7Co0. 3Fe2O4 nanocrystallites synthesized via co-precipitation route." Journal of Magnetism and Magnetic Materials **404**: 257-264.

56. Idrees, F., J. Hou, C. Cao, F. K. Butt, **I. Shakir,** M. Tahir and F. Idrees (2016). "Template-free synthesis of highly ordered 3D-hollow hierarchical Nb2O5 superstructures as an asymmetric supercapacitor by using inorganic electrolyte." Electrochimica Acta **216**: 332-338.

57. Khan, M. A., S. Riaz, I. Ali, M. N. Akhtar, G. Murtaza, M. Ahmad, **I. Shakir** and M. F. Warsi (2015). "Structural and magnetic behavior evaluation of Mg–Tb ferrite/polypyrrole nanocomposites." Ceramics International **41**(1): 651-656.

58. Khan, M. A., M. J. ur Rehman, K. Mahmood, I. Ali, M. N. Akhtar, G. Murtaza, **I. Shakir** and M. F. Warsi (2015). "Impacts of Tb substitution at cobalt site on structural, morphological and magnetic properties of cobalt ferrites synthesized via double sintering method." Ceramics International **41**(2): 2286-2293.

59. Kousar, F., S. Nazim, M. F. Warsi, M. A. Khan, M. N. Ashiq, Z. A. Gilani, **I. Shakir** and A. Wadood (2015). "La1− xEuxFeOs3 nanoparticles: Fabrication via micro-emulsion route for high frequency devices applications." Journal of Alloys and Compounds **629**: 315-318.

60. Kousar, T., I. Ahmad, M. A. Khan, G. Nasar, M. Shahid, **I. Shakir** and M. F. Warsi (2015). "Structural, electrical, dielectric and magnetic behavior of Gd1− xBixFe1− yZryO3 nanoparticles for advanced technological applications." Ceramics International **41**(7): 8578-8583.

61. Mumtaz, S., M. F. Warsi, M. N. ASHIQ, N. Karamat and **I. Shakir** (2015). "New nanostructured Al2Zr2-XVXO7 pyrochlore: structural, electrical and dielectric behavior

evaluation for high frequency devices fabrication." OPTOELECTRONICS AND ADVANCED MATERIALS-RAPID COMMUNICATIONS **9**(3-4): 404-409.

62. Nawaz, S., H. Malik, M. F. Warsi, M. Shahid, **I. Shakir,** A. Wadood and M. A. Khan (2015). "New La1− xCr0. 7xEu0. 3xFeO3 nanoparticles: Synthesis via wet chemical route, structural characterization for magnetic and dielectric behavior evaluation." Ceramics International **41**(5): 6812-6816.

63. Naz, M., A. Ghaffar, **I. Shakir** and Q. Naqvi (2015). "Analysis of optical focused electromagnetic field by a parabolic reflector coated with a plasma layer under normal incidence." JOURNAL OF OPTOELECTRONICS AND ADVANCED MATERIALS **17**(1-2): 27-32.

64. Naz, M., A. Ghaffar, **I. Shakir** and Q. Naqvi (2015). "Optical focused electromagnetic field of a perfect electromagnetic conductor elliptical reflector in un magnetized plasma environment." OPTOELECTRONICS AND ADVANCED MATERIALS-RAPID COMMUNICATIONS **9**(1-2): 208-212.

65. Naz, M., S. Shukrullah, A. Ghaffar, **I. Shakir**, S. Ullah, M. Sagir and M. Pervaiz (2015). "Surface morphology and mechanical strength of AISI M2 tool steel treated in abnormal glow region of plasma." Электронная обработка материалов **51**(1).

66. Pillai, A. S., R. Rajagopalan, A. Amruthalakshmi, J. Joseph, A. Ajay, **I. Shakir,** S. V. Nair and A. Balakrishnan (2015). "Mesoscopic architectures of Co (OH) 2 spheres with an extended array of microporous threads as pseudocapacitor electrode materials." Colloids and Surfaces A: Physicochemical and Engineering Aspects **470**: 280-289.

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