

## **Prof. Dr. Fayaz Hussain**

Professor & Chairman,  
Department of Materials Engineering,  
NED University of Engineering and Technology,  
University Road, Karachi, Pakistan, 75270.  
Mobile: +92-333-3946604  
[engrfayazned@gmail.com](mailto:engrfayazned@gmail.com),  
[fhussain@neduet.edu.pk](mailto:fhussain@neduet.edu.pk),



### **SUMMARY**

**Fayaz Hussain** joined the Department of Materials Engineering in 2007, first as a Lecturer, then after Assistant Professor in 2010, and promoted as an Associate Professor in 2020, then again promoted as a Professor and Chairman the Department of Materials Engineering in 2022. Prior to this, he worked three years in metal industry. He is also editorial board member of journals of “Frontiers in Materials”, “Electroactive Materials” and “Advanced Dielectrics”. He has completed his PhD from the University of Sheffield, England, UK, in 2016-2017, worked on “KNN based lead-oxide free piezoelectric ceramics”. This ABO<sub>3</sub> system has been studied from the perspective of optimizing its performance for multilayer actuators; potentially for energy harvesting applications under the supervision of Professor Ian Reaney at the University of Sheffield. To fabricate the multilayers, a novel Wet-Multilayer-Method (WMM) was also developed to overcome the issues of delamination during firing of multilayers actuators. He has authored/co-authored publications in well reputed journals, around **60 papers** including key articles on piezoelectric, capacitor and microwave dielectric ceramics in bulk and multilayers with **1031-citations**, **h-index 16 and i10-index 27** of last five years. Current research interests: Synthesis of Piezoelectric Ceramics and their multilayers, Multiferroics, Thermoelectric Ceramics and Microwave dielectrics. Characterisation Methods: LCR, impedance spectroscopy,  $d_{33}$  meter for piezoelectric coefficient, Vibrating Sample Magnetometer for magnetic properties, XRD Analysis, SEM/EDX, ferroelectric testing, etc.

### **ACADEMIC CAREER**

- **Ph.D.** (Functional Materials and Devices), the University of Sheffield, Sheffield, England, UK, in 2017.  
*Ph.D. Synopsis:* ‘KNN based lead free piezoelectric ceramics have been studied from the perspective of optimising their performance for multilayer actuators, potentially for energy harvesting applications. To this end, the defect chemistry of KNN has been investigated under different sintering conditions, dopants (acceptors:  $Mn^{2+}$ ,  $Ti^{4+}$ ,  $Sn^{4+}$  in KNN<sub>50/50</sub> ratio; Donor:  $Sr^{2+}$  in KNN<sub>50/50</sub> ratio;  $Ta^{5+}$  as an isovalent in KNN-51/49 ratio; and co-dopants:  $Bi^{3+}$  and  $Zr^{4+}$  in KNN<sub>50/50</sub> ratio) have been incorporated into KNN to enhance the piezoelectric performance and prototype multilayers of 10 and 16 layers with inner Pt electrodes have been fabricated to demonstrate the potential of 0.942KNN-0.058BNZ+ZrO<sub>2</sub> for the fabrication of multilayer actuators. This lead-free composition has the potential to replace PZT-4 and PZT-8 in piezoelectric devices for room temperature applications. To fabricate the multilayers, a novel Wet-Multilayer-Method (WMM) was also developed to overcome the issues of delamination during firing of MLCCs’.
- **M.E.** (Materials Engineering) from NED University of Engineering & Technology Karachi Pakistan in 2009.
- **B.E.** (Metallurgy) from Mehran University of Engineering & Technology, Jamshoro Pakistan in 2003.

### **TEACHING EXPERIENCE**

- Professor in Materials Engineering Department of NED University of Engineering and Technology, Karachi (from 11th January 2022 to date).
- Associate Professor in Materials Engineering Department of NED University of Engineering and Technology, Karachi (from 04th August 2020 to 10th January 2022).

- Assistant Professor in Materials Engineering Department of NED University of Engineering and Technology, Karachi (from 22nd June 2010 to 04<sup>th</sup> August 2020).
- Lecturer in Materials Engineering Department of NED University of Engineering and Technology, Karachi (from 2nd July 2007 to 21st June 2010).

## OTHER JOB EXPERIENCE

**Assistant Manager:** Melting Shop (Ladle Furnace) Peoples Steel Mills Ltd. From June 2004 to June 2007:

- Experience of alloying and refining of different types of Steel Alloys, i.e. extra low carbon, low carbon, medium carbon, high carbon, low alloy, medium alloy and high alloy steels.

**Q.C Engineer:** (ultrasonic testing), Shashi Steel Pipe Works Pvt. Ltd. From March 2004 to June 2004:

- Worked to check the lamination, internal flaws, voids etc. of steel pipes of different dia.

## RESEARCH INTERESTS

- Electroceramics in general
- Ceramics by Cold-Sintering
- Piezoelectric Ceramics
- Multilayers Capacitors and Actuators
- Microwave Dielectrics
- Multiferroic Materials

## CONFERENCES / SEMINAR / SYMPOSIA

1. **Fayaz Hussain, 2<sup>nd</sup> International Conference titled Blurring the Barriers**, 17-12-2024 to 18-12-2024 at Dawood University of Engineering & Technology, Karachi, **Pakistan**.
2. **Fayaz Hussain, 4<sup>th</sup> International Symposium on Characterization (ISC 24)**, 14-10-2024 to 19-10-2024 at Sakarya University, **Turkiye**.
3. **Fayaz Hussain, 18<sup>th</sup> International Symposium on Advanced Materials (ISAM-2023)** 02-10-2023 to 06-10-2023 at Islamabad. (**Invited Speaker, Sessions Chair**)
2. **Fayaz Hussain, 3<sup>rd</sup>, International Symposium on Characterization** 06-08 September 2023 **Istanbul /Turkiye**. (**Invited as committee member, Session Chair, with travel grant**)
3. **Fayaz Hussain, 3 Days Workshop on Materials Characterisation**, 13 to 15 June, 2023, Organized by AMF, PITP, PSM & NED University, (**Trainer and Resource Person**)
4. **Fayaz Hussain, 2<sup>nd</sup>, International Symposium on Characterization** **22-25 September 2022 Afyonkarahisar/Turkiye**. (**Invited Talk, Session Chair, with travel grant**)
5. **Fayaz Hussain, 1<sup>st</sup> International Conference on Advances in Materials Science and Environmental Engineering (ICAMSEE-2021)**, NED University of Engineering & Technology, Karachi, 25 & 26 June, 2021. (**Conference Secretary**)
6. **Fayaz Hussain, 3rd International Conference on Advance Materials & Process Engineering (AMPE-2019)** will be held on December 11-12, 2019 at the main NED University Campus, (**Committee Member & Sessions Chair**)
7. **Fayaz Hussain, 1<sup>st</sup> International Conference on Applied Physics & Engineering**, ICAPE 2021, 16 & 17 September 2021, Department of Physics, NED University of Engineering & Technology, Karachi, (**Session Chair**)
8. **Fayaz Hussain, 2nd International Conference on Advance Materials & Process Engineering (AMPE-2017)** on December 12-13, 2017 at the main N.E.D. University (**Member & Session Chair**).
9. **Fayaz Hussain, Muhammad Imran Khan, Muhammad Tufail, "Electrical and magnetic properties of Fe<sup>3+</sup> doped SrTiO<sub>3</sub> Ceramics"**, Electroceramics XVII conference, Online, **Darmstadt 24-28 August 2020, Germany**.
10. **Fayaz Hussain, Dawei Wang, Ian Reaney, "A novel multilayer method for low cost fabrication of piezoelectric actuators"**, 2019 IEEE International Symposium on Applications of Ferroelectrics (ISAF), EPFL Lausanne Switzerland, **July 14-19, 2019**.

11. Dawei Wang, **Fayaz Hussain**, Amir Khesro, Antonio Feteira, Ye Tian and Ian M Reaney, "Composition and Temperature Dependence of Piezoelectricity in KNN-based Lead-free Ceramics". 2016 Joint IEEE International Symposium on the Applications of Ferroelectrics, European Conference on Applications of Polar Dielectrics, Darmstadt Germany.
12. Shunsuke Murakami, Amir Khesro, **Fayaz Hussain**, Dawei Wang, Derek C Sinclair and Ian M Reaney, "Doping Effects in Lead-free Piezoelectric BT-BF based Ceramics", Sustainable Functional Materials April 2016, Scarborough, UK
13. **Fayaz Hussain**, Iasmi Sterianou, Derek C Sinclair, Ian M Reaney, Semiconductor Behaviour of  $K_xNa_{(1-x)}NbO_3$  ( $0.49 \leq x \leq 0.51$ ) as a function of  $P(O_2)$ , Electroceramics-XIV Conference, 16-20 June 2016, Bucharest, Romania.
14. **Fayaz Hussain**, Iasmi Sterianou, Derek C Sinclair, Ian M Reaney, Properties of  $K_{0.50}Na_{0.50}NbO_3$  Sintered in  $N_2$  and Air, Ferroelectrics UK, 17-18 January 2013, IOP, University of Sheffield, Sheffield, UK.
15. Umair Aftab, M. I. Abro, Khanji Harijian, Moazam Baloch, M. Aqeel Bhutto, **Fayaz Hussain**, "Effect Of Ceria On Mic Susceptibility Of Aluminium-Zinc Sacrificial Anode", Conference: 2nd International Conference on Energy, Environmental and Sustainable Development (EESD 2012), At: Mehran University of Engineering and Technology, Jamshoro, Pakistan.
16. **Fayaz Hussain**, Ashraf Ali, "Elastic and Plastic Properties of Soda Lime Glass by Micro Indentation", ISAM 2009, Pakistan.

## FUNDED PROJECTS

- PI: Rs.3.5 million from Sindh HEC for "Green Energy Source and Environmentally friendly lead-oxide free piezoelectric ceramics for energy harvesting devices" (Completed)
- Rs. 3 Million for PhD Project under my supervision (Completed)
- Rs. 1 Million for PhD Project under my supervision
- Rs. 1 Million for PhD Project under my supervision
- Rs. 1 Million for ISP, Co-PI (Completed)
- Rs. 1 Million for PhD Project under my supervision (Ms. Ghazala Aftab)
- Rs. 4 Million for PhD Project under my supervision (Mr. Umair Jamal)
- Rs. 0.5 Million for PhD Project under my supervision (Mr. Mudassir Farooq)
- PI: Rs. 9.8 million for NRPU-2021 on "Environmentally friendly Multiferroic Ceramics for Electronic Applications by cold sintering method" (on-going)
- PI: Rs. 170 million approx. SDGF from United Nations, USA, on High Density charge storage Capacitors, under process of approval.

## REWARDS / AWARDS

- More than Rs. 1Million from NEDUET, as financial reward for publishing the research paper since 2020 & 2021
- Best Publication Awards in 2018, 2020 and 2022 by NED Alumni Association of Southern California, USA.
- Best Teacher Award in 2022 by NED Alumni Association of Southern California, USA.

## PhD (Students) PROJECTS: Under-Supervision

- TTB-based Multiferroic Ceramics (Supervision, graduated this year 2023)
- Bio-ceramics/glass Coating on implants (Supervision)
- TTB-based Multiferroic Ceramics (Supervision)
- High density storage capacitors through 3D printing (Supervision)
- Piezoelectrics through microwave sintering (Supervision)
- Thermoelectric Ceramics (Supervision)

## ISP OR THESIS PROJECTS M. Engg.

- More than 20 projects supervised on electroceramics and other materials

## EDITORIAL BOARD MEMBER

- Guest Editor in “Ceramics” Journal (JCR)
- Guest Editor in “International Journal of Energy Research”, Trends and Prospects in Zinc Based Energy Storage
- Journal of Frontiers in Materials (JCR, <https://www.frontiersin.org/journals/materials#editorial-board>)
- Electro-active Materials (Malaysia, <https://www.electroactmater.com/index.php/editorial-board>).
- Journal of Advanced Dielectrics Editorial Board, Xian Jiaotong University, China, <https://www.worldscientific.com/page/jad/early-career-editorial-board>
- Guest Editor in “Crystals” Journal (JCR)

## LIST OF KEY PUBLICATIONS

1. Wei Wang, Qingyao Wang, Diming Xu, Zhongqi Shi, Tiezhu Guo, **Fayaz Hussain**, Moustafa Adel Darwish, Tao Zhou, Yawei Chen, Qixin Liang, Meirong Zhang, Di Zhou, “[Temperature stable \(1-x\) BaAl<sub>2</sub>Si<sub>2</sub>O<sub>8</sub>-xBa<sub>3</sub>V<sub>2</sub>O<sub>8</sub> \(0.2 ≤ x ≤ 0.5\) microwave dielectric composite ceramics for LTCC applications](#)”, Journal of the European Ceramic Society, 2025
2. Mokhtar Ghodbane, Boussad Boumeddane, **Fayaz Hussain**, Naima El-Amarty, Khadija Lahrech, Arsenio Barbon, “[Linear Fresnel Reflector Power Plants in Algeria: Energy, Economic, and Environmental Analysis](#)”, Journal of Solar Energy Engineering, 2024.
3. Ali Nawaz Sanjrani, Hong Zhong Huang, Sadiq Ali Shah, **Fayaz Hussain**, Muhammad Punhal, Attaullah Narejo, Bo Zhang, “[High-Speed Train Wheel Set Bearing Analysis: Practical Approach to Maintenance Between End of Life and Useful Life Extension Assessment](#)”, Results in Engineering, 2024.
4. Yang Yao, Lin Cao, Haoyue Yang, Raz Muhammad, Yingjie Ren, Xinjiang Luo, **Fayaz Hussain**, Bing Liu, Minmin Mao, Hadi Barzegar Bafrooei, Ehsan Taheri-Nassaj, Kaixin Song, “[High-entropy Mg<sub>1-8R0.2</sub>Al<sub>4</sub>Si<sub>5</sub>O<sub>18</sub> \(R= Ni, Co, Zn, Cu, Mn\) cordierite ceramics: Influence of octahedral distortion and electronegativity mismatch on the microwave dielectric ...](#)”, Ceramics International, 2024.
5. Zi-Yang Liu, Wei Wang, Di-Ming Xu, Chao Du, Xin Wang, Guo-Qiang He, **Fayaz Hussain**, Tao Zhou, Biao-Bing Jin, Ke-Hong Zhou, Jun Li, Chao Liang, Di Zhou, “[Microwave dielectric properties, vibrational spectrum, and antenna design of a novel melilite-type Ba<sub>2</sub>CoSi<sub>2</sub>O<sub>7</sub> ceramic](#)”, Journal of the American Ceramic Society, 2024.
6. Muhammad Fahad Riaz, **Fayaz Hussain**, Ali Dad Chandio, “[Temperature dependent dielectric and ferroelectric properties of Sr<sub>2</sub>Na \(1-x\) K \(x\) Nb<sub>5</sub>O<sub>15</sub> \(0 ≤ x ≤ 0.07\) Tetragonal Tungsten Bronze \(TTB\) ceramics](#)”, Ceramics International, 2024.
7. Jin Fang, Tao Ni, Minmin Mao, Yu Liu, Huan Liu, Lei Cao, Xueqing Yu, Bing Liu, Hadi Barzegar Bafrooei, Liang He, Yingjie Ren, **Fayaz Hussain**, Dawei Wang, Kaixin Song,” [Harnessing Cu incorporation for achieving stable superior microwave dielectric properties in low permittivity MgSiO<sub>3</sub>-based ceramics through effective phase transition suppression](#)”, Ceramics International, 2024.
8. Yu Lou, Wei Wang, Di-Ming Xu, Chao Du, Xin Wang, **Fayaz Hussain**, Moustafa Adel Darwish, Tao Zhou, Ya-Wei Chen, Qi-Xin Liang, Mei-Rong Zhang, Yong-Qiang Pang, Di Zhou, “[Effect of LiF and LBSCA glass on the microwave dielectric properties of 0.5BaCuSi<sub>4</sub>O<sub>10</sub>-0.5BaCuSi<sub>2</sub>O<sub>6</sub>-based ceramics for LTCC applications](#)”, Journal of the American Ceramic Society, 2024.

9. Wanqing Qian, Qingliang Xu, Xueqing Yu, **Fayaz Hussain**, Xinhua Chen, Weitao Su, Shikuan Sun, Kaixin Song, "[Color tunable Er-Eu co-doped double perovskite  \$\text{La}\_2\text{MgSnO}\_6\$  phosphor for optical temperature sensor](#)", Journal of Materials Science: Materials in Electronics, 2024.
10. Abdul Wahab Jatoui, Najeebullah Channa, Muhammad Ishaque Abro, Umair Aftab, Muhammad Hassan Agheem, **Fayaz Hussain**, "[Colored antimicrobial protective clothing produced by dopamine-based AgNPs generation method](#)", Biomedical Materials & Devices, 2024.
11. Muhammad Ali Ijaz Malik, Sadaf Zeeshan, Muhammad Khubaib, Adeel Ikram, **Fayaz Hussain**, Hayati Yassin, Atika Qazi, "[A review of major trends, opportunities, and technical challenges in biodiesel production from waste sources](#)", Energy Conversion and Management: X, 2024.
12. Rabiya Asad, S Ahmed Uzair, Eraj Humayun Mirza, M Rizwan, Rodianah Alias, Ali Dad Chandio, **Fayaz Hussain**, "[Development of ceramic layer on magnesium and its alloys for bone implant applications using plasma electrolytic oxidation \(PEO\)](#)", Journal of the Australian Ceramic Society, 2024.
13. Muhammad Usman, Amna Malik, Hafiz Zahid Nabi, Muhammad Imran Masood, Muhammad Mujtaba Abbas, Yasser Fouad, **Fayaz Hussain**, Atika Qazi, "[Carbon taxation on high utility transport fuels: An implementation of enviro-economic analysis for the sustainable environment](#)", Heliyon, 2024.
14. Soulef Largot, Nouredine Bessous, Mokhtar Ghodbane, Boussad Boumeddane, **Fayaz Hussain**, Muhammad Shafi, Bo Zhang, Ali Wadi Al-Fatlawi, Abdelhalim Borni, "[Experimental study on the effect of operational and environmental conditions on photovoltaic modules productivity in El-Oued region, algeria](#)", Energy Conversion and Management: X, 2024.
15. Chang-Hao Wang, Wei Wang, Di-Ming Xu, Ahmed Redwan Hazaa Alzakree, **Fayaz Hussain**, Moustafa Adel Darwish, Tao Zhou, Ya-Wei Chen, Qi-Xin Liang, Mei-Rong Zhang, Yaguang Wu, Di Zhou, "[Low Temperature Sintering and Improvement of Temperature Stability of  \$\text{Ba}\_3\text{P}\_4\text{O}\_{13}\$  Microwave Dielectric Ceramics by BCB additions](#)", Materials Research Bulletin, 2024.
16. Diming Xu, Haowei Zhang, Lixia Pang, **Fayaz Hussain**, Tao Zhou, Shi-Kuan Sun, Zhijiao Chen, Di Zhou "[Rational optimizations of high K microwave dielectric ceramic  \$\text{Bi}\_2\(\text{Li}\_{0.5}\text{Ta}\_{1.5}\)\text{O}\_7\$  toward LTCC applications](#)", Journal of the American Ceramic Society, 2024.
17. Yu Liu, Minmin Mao, Tao Ni, Huan Liu, Jin Fang, Lei Li, Hadi Barzegar Bafrooei, Feng Shi, **Fayaz Hussain**, Dawei Wang, Kaixin Song, "[Unleashing the potential of  \$\text{Mg}\_2\text{SiO}\_4\$ -based ceramics for millimeter-wave applications: Achieving ultra-low loss with enhanced temperature stability through heterovalent ion ...](#)", Ceramics International, 2024.
18. Li-Xia Pang, Zhen Fang, Di Zhou, Wei Wang, Zhong-Qi Shi, **Fayaz Hussain**, Moustafa Adel Darwish, Tao Zhou, Shi-Kuan Sun, Qi-Xin Liang, Ya-Wei Chen, "[Sintering behaviors and microwave dielectric properties of  \$\text{BaO-MgO-SiO}\_2\$  ternary ceramics](#)", International Journal of Applied Ceramic Technology, 2024.
19. Muhammad Rahim, **Fayaz Hussain**, Muhammad Khalid, Nasir Abbas, Muhammad Ateeq, MGB Ashiq, Muhammad Younas, Thamraa Alshahrani, "[Structural and dielectric properties of Cerium doped Magnesium-Zinc Aluminate spinel nano-crystallites for high frequency applications](#)", Ceramics International, 2024
20. Fengsheng Zeng, Jiuyuan Han, Guoyun Shao, Rengang Shi, Raz Muhammad, Yuanyuan Zhang, **Fayaz Hussain**, Hadi Barzegar Bafrooei, Ehsan Taheri-Nassaj, Kaixin Song, "[Preferential site occupancy, octahedral stabilization energy, and microwave dielectric properties of mixed spinel  \$\text{Mg}\_{0.95}\text{X}\_{0.05}\text{Al}\_2\text{O}\_4\$](#) ", Ceramics International, 2024.

21. Yang Yao, Lin Cao, Haoyue Yang, Raz Muhammad, Yingjie Ren, Xinjiang Luo, **Fayaz Hussain**, Bing Liu, Minmin Mao, Hadi Barzegar Bafrooei, Ehsan Taheri-Nassaj, Kaixin Song, "[High-entropy  \$Mg\_{1-8R}O\_{2Al\_4Si\_5O\_{18}}\$  \( \$R = Ni, Co, Zn, Cu, Mn\$ \) cordierite ceramics: Influence of octahedral distortion and electronegativity mismatch on the microwave dielectric ...](#)", *Ceramics International*, 2024.
22. Abdul Wahab Jatoi, Najeebullah Channa, Muhammad Ishaque Abro, Umair Aftab, Muhammad Hassan Agheem, **Fayaz Hussain**, "[Colored Antimicrobial Protective Clothing Produced by Dopamine-Based AgNPs Generation Method](#)", *Biomedical Materials & Devices*, 2023.
23. Diming Xu, Haowei Zhang, Lixia Pang, **Fayaz Hussain**, Tao Zhou, Shi-Kuan Sun, Zhijiao Chen, Di Zhou, "[Novel B-site scheelite structure ceramic  \$Bi\(Ge\_{0.5}Mo\_{0.5}\)O\_4\$  and its dielectric properties](#)", *Journal of the American Ceramic Society*, 2023.
24. Aurang Zeb, Fazli Akram, Muhammad Habib, Qamar Iqbal, Amir Ullah, Ihsan Ullah, Nasir Ali, SJ Milne, Muhammad Sheeraz, Conrad Ingram, Shahid Iqbal, **Fayaz Hussain**, Adnan Younis, PT Tho, Chang Won Ahn "[Revealing the influence of Nb-doping on the crystal structure and electromechanical properties of  \$\(K, Bi\)\(Mg, Ti, Nb\)O\_3\$  ceramics](#)" *Journal of Electroceramics*, 2023.
25. Hareem Zubairi, **Fayaz Hussain**, Sajida Sheikh, Asif Ahmed Shaikh, Dawei Wang, Ian M Reaney, "[Comparative study of cold assisted and conventional sintering of  \$\(1-2x\) K\_0.5Na\_{0.5}NbO\_3-xBaTiO\_3-xBiFeO\_3\$  multiferroic ceramics](#)", *Materials Science and Engineering: B*, vol.296, pp. 116632, 2023.
26. A. Alshoaibi, I. H. Bhellar, **F. Hussain**, H. Zubairi, S. Shaikh, and S. Faouri, "[Functional properties of  \$Sr\_{1-x}Gd\_xTiO\_3\$  ceramics synthesized by solid state reaction method](#)," *Materials Research Express*, 2023.
27. H. Zhu, J. Wu, **F. Hussain**, T. Ni, J. Li, Y. Wang, H. Xi, M. Mao, J. Hu, and B. Liu, "[Electrostrain optimization of  \$Bi\_{0.5}Na\_{0.5}TiO\_3\$ -based lead-free piezoceramics by  \$CaZrO\_3\$  modifying](#)," *Journal of Materials Science: Materials in Electronics*, vol. 34, no. 7, pp. 650, 2023.
28. D. Zhou, L. Zhang, D.-M. Xu, F. Qiao, X. Yao, H. Lin, W. Liu, L.-X. Pang, **F. Hussain**, and M. A. Darwish, "[Novel Method to Achieve Temperature-Stable Microwave Dielectric Ceramics: A Case in the Fergusonite-Structured  \$NdNbO\_4\$  System](#)," *ACS Applied Materials & Interfaces*, vol. 15, no. 15, pp. 19129-19136, 2023.
29. T. Ibn-Mohammed, S. Koh, K. Mustapha, L. Smith, A. Acquaye, A. Iyasara, **F. Hussain**, N. Morley, D. Sinclair, and C. Randall, "[Techno-environmental analysis of material substitution in thermoelectric modules: non-oxide \(bismuth telluride alloys\) vs. oxide-based \(lanthanum-doped strontium titanate and calcium cobaltite\) materials](#)," *Energy Conversion and Management*: X, pp. 100395, 2023.
30. C. Yang, C. Fan, **F. Hussain**, W. Sheng, K. Song, J. Wu, Q. Huang, W. Su, J. Xu, and S. Sun, "[Luminescent ionic lattice occupation and wide tunable emission spectra of  \$La\_2MgZrO\_6: Bi^{3+}, Eu^{3+}\$  double perovskite phosphors for white light LED](#)," *Journal of Rare Earths*, vol. 41, no. 4, pp. 489-497, 2023.
31. Sajida Sheikh, **Fayaz Hussain**, "[Structural, Dielectric, and Magnetic Properties of  \$Ba\_2Bi\_{9-x}Fe\_{5+x}Ti\_8O\_{39}\$  Tetragonal Tungsten Bronze ceramics](#)" *Materials Research Express*, 2023.
32. Haipeng Zhu, Jinyuan Wu, **Fayaz Hussain**, Tao Ni, Jiajing Li, Yan Wang, Hao Xi, Minmin Mao, Ji Hu, Bing Liu, Kaixin Song, "[Electrostrain optimization of  \$Bi\_{0.5}Na\_{0.5}TiO\_3\$ -based lead-free piezoceramics by  \$CaZrO\_3\$  modifying](#)" *Journal of Materials Science: Materials in Electronics*, 2023.
33. Adil Alshoaibi, **Fayaz Hussain**, Fatima Mohsin, Nisrin Alnaim, Najla Almulhem, "[Different concentrations of  \$Ti^{4+}\$  as a donor and electronic properties of  \$Bi\_{2-x}Ti\_xO\_3\$](#) ", *Frontiers in Materials*, 2023.
34. Abdul Wahab Jatoi, Muhammad Ishaque Abro, **Fayaz Hussain**, "[Exploitation of remarkable features of  \$GrOAgNPs\$  embedded in nanofiber matrix for effective wound healing applications](#)", *Materials Letters*, 2023.

35. Li-Xia Pang, Di Zhou, Xiao-Gang Yao, Hui-Xing Lin, Chen Chen, Zhong-Qi Shi, **Fayaz Hussain**, Moustafa Adel Darwish, Tao Zhou, Shi-Kuan Sun, Qi-Xin Liang, Ya-Wei Chen, "[Phase transitions and microwave dielectric behaviors of the  \$\(\text{Bi}\_{1-x}\text{Li}\_{0.5x}\text{Y}\_{0.5x}\)\(\text{V}\_{1-x}\text{Mo}\_x\)\text{O}\_4\$  ceramics](#)", *Journal of the American Ceramic Society*, 2023.
36. Xinhua Chen, Qingliang Xu, **Fayaz Hussain**, Chen Yang, Weiqin Sheng, Xinjiang Luo, Bing Liu, Shikuan Sun, Dawei Wang, Kaixin Song, "[High Thermal Stability and Color Purity of  \$\text{Y}\_2\text{SrAl}\_4\text{SiO}\_{12}:\text{Eu}^{3+}\$  Garnet-Variant-Structured Phosphor for Warm White Light LED-Lamp](#)" *Crystals*, 2022.
37. Hareem Zubairi, Areeba Essani, Doha Majeed, **Fayaz Hussain**, Muhammad Sohail, "[Re-engineering of Waste Products into Useful Construction Materials](#)" *Journal of Characterization*, 2022.
38. Shehzad Khan, Basit Ali, Muhammad Salman, Raz Muhammad, Majid Khan, **Fayaz Hussain**, Kaixin Song, Dawei Wang, "[Spinel  \$\text{M}\_0.5\text{Zn}\_0.5\text{Fe}\_2\text{O}\_4\$  \( \$\text{M} = \text{Ni, Co, and Cu}\$ \) ferrites for energy storage applications: Dielectric, magnetic and electrochemical properties](#)" *Ceramics International*, 2022.
39. Chen Yang, Chenli Fan, **Fayaz Hussain**, Zijun Ye, Weiqing Sheng, Kaixin Song, Raz Muhammad, Jun Wu, Qingming Huang, Huanping Wang, Weitao Su, Junming Xu, Shikuan Sun, Dawei Wang "[Sn<sup>4+</sup> induced Bi<sup>3+</sup> multi-lattice selective occupation and its color-tunable emission of  \$\text{La}\_2\text{MgZrO}\_6:\text{Bi}^{3+}, \text{Sn}^{4+}\$  double perovskite phosphors](#)" *Journal of Alloys and Compounds*, 2022.
40. Weichao Lou, Kaixin Song, **Fayaz Hussain**, Amir Khesro, Jianwei Zhao, Hadi Barzegar Bafrooei, Tao Zhou, Bing Liu, Minmin Mao, Kuiwen Xu, Ehsan Taheri-nassaj, Di Zhou, Shaojin Luo, Shikuan Sun, Huixing Lin, Dawei Wang "[Microwave dielectric properties of  \$\text{Mg}\_{1-8R}0.2\text{Al}\_4\text{Si}\_5\text{O}\_{18}\$  \( \$\text{R} = \text{Mg, Ca, Sr, Ba, Mn, Co, Ni, Cu, Zn}\$ \) cordierite ceramics and their application for 5G microstrip patch antenna](#)" *Journal of the European Ceramic Society*, 2022.
41. Chen Yang, Chenli Fan, **Fayaz Hussain**, Weiqing Sheng, Kaixin Song, Jun Wu, Qingming Huang, Weitao Su, Junming Xu, Shikuan Sun, Dawei Wang, "[Luminescent ionic lattice occupation and wide tunable emission spectra of  \$\text{La}\_2\text{MgZrO}\_6:\text{Bi}^{3+}, \text{Eu}^{3+}\$  double perovskite phosphors for white light LED](#)" *Journal of Rare Earths*, 2022.
42. Shengkai Zhu, Zhichao Huang, Weichao Lou, Kaixin Song, Amir Khesro, **Fayaz Hussain**, Zhenyu Tan, Xinjiang Luo, Minmin Mao, Lingyun Xue, Ping Xu, Bing Liu, Huixing Lin, Dawei Wang, "[5G microstrip patch antenna and microwave dielectric properties of 4 mol%  \$\text{LiF-MgO-xwt\% MTiO}\_3\$  \( \$\text{M} = \text{Ca, Sr}\$ \) composite ceramics](#)" *Journal of Materials Science: Materials in Electronics*, 2021.
43. Muhammad Salman, Majid Khan, Sumaiya Saleem, Salman Ali, **Fayaz Hussain**, Raz Muhammad, Amir Khesro, Yihan Ling, "[Non-stoichiometric zinc ferrite nanostructures: Dielectric, magnetic, optical and photoelectrochemical properties](#)" *Materials Today Communications*, 2021.
44. M. Xu, C. Fan, C. Yang, K. Song, **F. Hussain**, W. Sheng, J. Wu, H. Wang, W. Su, and Q. Huang, "Lattices selective occupation, optical spectra regulation, and photoluminescence properties of  $\text{Eu}^{2+}$  activated  $\text{Ca}_9\text{La}(\text{PO}_4)_7$  phosphor," *Journal of Luminescence*, pp. 118197, 2021.
45. Mingtao Ma, Kaixin Song, Yuping Ji, **Fayaz Hussain**, Amir Khesro, Minmin Mao, Lingyun Xue, Ping Xu, Bing Liu, Zhilun Lu, Di Zhou, Dawei Wang, Shikuan Sun, "[5G microstrip patch antenna and microwave dielectric properties of cold sintered  \$\text{LiWVO}\_6\text{-K}\_2\text{MoO}\_4\$  composite ceramics](#)" *Ceramics International*, 2021
46. H. Qian, C. Fan, **F. Hussain**, K. Song, X. Luo, W. Su, H. Wang, Q. Huang, and L. Yang, "Energy transfer between two luminescent centers and photoluminescent properties of  $\text{Ca}_{4-y}\text{La}_6(\text{AlO}_4)_x(\text{SiO}_4)_{6-x}\text{O}_{1-x/2}:\text{yEu}^{2+}$  apatite structure phosphors," *Journal of Luminescence*, vol. 235, pp. 117991, 2021.
47. W.-B. Li, D. Zhou, W.-F. Liu, J.-Z. Su, **F. Hussain**, D.-W. Wang, G. Wang, Z.-L. Lu, and Q.-P. Wang, "High-temperature  $\text{BaTiO}_3$ -based ternary dielectric multilayers for energy storage applications with high efficiency," *Chemical Engineering Journal*, vol. 414, pp. 128760, 2021.

48. Syed Ali Afzal, **Fayaz Hussain**, Sajid Hussain Siyal, Muhammad Sufyan Javed, Muhammad Saleem, Muhammad Imran, Mohammed A Assiri, Aboud Ahmed Awadh Bahajjaj, Ayman A Ghfar, Murefah Mana AL-Anazy, Mohamed Ouladsmame, Saad Al-Tamrah, Shafaqat Ali, "[Weight Loss during Calcination and Sintering Process of  \$\text{Na}\_{0.5}\text{Bi}\_{0.5}\text{TiO}\_3\text{-Bi}\_{1/2}\(\text{Mg}\_{2/3}\text{Nb}\_{1/3}\)\text{O}\_3\$  Composite Lead-Free Piezoelectric Ceramics](#)" *Coatings*, 2021.
49. Sarah Faheem, Muhammad Sohail, **Fayaz Hussain**, Muhammad Maaz, Bilal Abbas, "[Synthesis and Characterization of Chitosan and Graphene Oxide to Form a Nano-Composite Hydrogel for the Removal of Heavy Metal Ions](#)" *Journal of Water Chemistry and Technology*, 2021.
50. R. Iftikhar, A. Ansari, N. N. Siddiqui, **F. Hussain**, and A. Aman, "Structural elucidation and cytotoxic analysis of a fructan based biopolymer produced extracellularly by *Zymomonas mobilis* KIBGE-IB14," *Carbohydrate Research*, vol. 499, pp. 108223, 2021.
51. W. Lou, K. Song, **F. Hussain**, B. Liu, H. B. Bafrooei, H. Lin, W. Su, F. Shi, and D. Wang, "Bond characteristics and microwave dielectric properties of  $(\text{Li}_{0.5}\text{Ga}_{0.5})^{2+}$  doped  $\text{Mg}_2\text{Al}_4\text{Si}_5\text{O}_{18}$  ceramics," *Ceramics International*, vol. 46, no. 18, pp. 28631- 28638, 2020.
52. Shu-Zhao Hao, Di Zhou, **Fayaz Hussain**, Jin-Zhan Su, Wen-Feng Liu, Da-Wei Wang, Qiu-Ping Wang, Ze-Ming Qi, "[Novel scheelite-type  \$\[\text{Ca}\_{0.55}\(\text{Nd}\_{1-x}\text{Bi}\_x\)\_{0.3}\]\text{MoO}\_4\$  \( \$0.2 \leq x < 0.95\$ \) microwave dielectric ceramics with low sintering temperature](#)" *Journal of the American Ceramic Society*, 2020.
53. A. Khesro, D. Wang, **F. Hussain**, R. Muhammad, G. Wang, A. Feteira, and I. M. Reaney, "Temperature dependent piezoelectric properties of lead-free  $(1-x) \text{K}_{0.6}\text{Na}_{0.4}\text{NbO}_3\text{-xBiFeO}_3$  ceramics," *Frontiers in Materials*, vol. 7, pp. 140, 2020.
54. **F. Hussain**, A. Khesro, Z. Lu, G. Wang, and D. Wang, "Lead free multilayer piezoelectric actuators by economically new approach," *Frontiers in Materials*, vol. 7, 2020.
55. **F. Hussain**, A. Khesro, Z. Lu, N. Alotaibi, A. A. Mohamad, G. Wang, D. Wang, and D. Zhou, "Acceptor and donor dopants in potassium sodium niobate based ceramics", *Frontiers in Materials*, vol. 7, 2020.
56. D. Han, C. Wang, D. Lu, **F. Hussain**, D. Wang, and F. Meng, "A temperature stable  $(\text{Ba}_{1-x}\text{Cex})(\text{Ti}_{1-x/2}\text{Mgx}/2)\text{O}_3$  lead-free ceramic for X4D capacitors," *Journal of Alloys and Compounds*, vol. 821, pp. 153480, 2020.
57. S. H. Abro, **F. Hussain**, M. Sohail, D. Tariq, K. Jawed, R. Sanwal, and M. N. Alghamdi, "Development and Synthesis of Composite Electrode (rGO/G/PANI) for Capacitor from Burnout Battery Powder: Composite Electrode (rGO/G/PANI) for Capacitor," *Proceedings of the Pakistan Academy of Sciences: A. Physical and Computational Sciences*, vol. 57, no. 2, pp. 41-50, 2020.
58. R. Muhammad, S. Khan, **F. Hussain**, and A. Khesro, "Phase evolution and microwave dielectric properties of  $(\text{Ca}/\text{Sr}) \text{Nd}_4\text{Ti}_5\text{O}_{17}$ -based ceramic systems," *Materials Research Express*, 2019.
59. **F. Hussain**, A. Khesro, R. Muhammad, and D. Wang, "Effect of Ta-doping on functional properties of  $\text{K}_{0.51}\text{Na}_{0.49}\text{NbO}_3$ ," *Materials Research Express*, vol. 6, no. 10, pp. 106309, 2019.
60. **F. Hussain**, I. Sterianou, A. Khesro, D. C. Sinclair, and I. M. Reaney, "p-Type/n-type behaviour and functional properties of  $\text{K}_x\text{Na}_{(1-x)}\text{NbO}_3$  ( $0.49 \leq x \leq 0.51$ ) sintered in air and  $\text{N}_2$ ," *Journal of the European Ceramic Society*, vol. 38, no. 9, pp. 3118-3126, 2018.
61. Dawei Wang, **Fayaz Hussain**, Amir Khesro, Antonio Feteira, Ye Tian, Quanliang Zhao, Ian M Reaney, "[Composition and temperature dependence of structure and piezoelectricity in  \$\(1-x\)\(\text{K}\_{1-y}\text{Na}\_y\)\text{NbO}\_3\text{-x}\(\text{Bi}\_{1/2}\text{Na}\_{1/2}\)\text{ZrO}\_3\$  lead-free ceramics](#)" *Journal of the American Ceramic Society*, 2017.
62. A. Khesro, D. Wang, **F. Hussain**, D. C. Sinclair, A. Feteira, and I. M. Reaney, "Temperature stable and

fatigue resistant lead-free ceramics for actuators,” *Applied Physics Letters*, vol. 109, no. 14, pp. 142907, 2016.