CURRICULUM VITAE

Personal Information:

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Current Address: Centralized Resource Laboratory, University of Peshawar, 25120

Peshawar, Khyber Pakhtunkhwa, Pakistan.

Education

SSC [2001]

Science, Board of Intermediate and Secondary Education (BISE), Bannu, KPK, Pakistan

F.Sc [2003]

Pre-medical, BISE, Bannu, Pakistan

B.Sc [2005]

Gomal University Dera Ismail Khan, Pakistan

M.Sc [2007]

Analytical Chemistry, Institute of Chemical Sciences, University of Peshawar, Pakistan

Project Title "Development of extractive Spectrophotometric method for the quantitative determination of Lidocaine in pharmaceutical formulations"

M.Phil (Post Mater Degree) [2014]

Physical Chemistry National Center of Excellence in Physical chemistry, University of Peshawar, Pakistan

Project Title "Synthesis, characterization and gas sensing properties of uniform fine Particles of copper (II) oxide"

Ph.D [2018]

Analytical Chemistry, Department of Chemistry, Islamia College Peshawar, Pakistan

Project Title "Synthesis, characterization, and analytical applications of polypyrrole-metal oxide composites"

Work Experience

I have been employed as a Lecturer/Analytical Chemist at the Centralized Resource Laboratory, University of Peshawar, Pakistan since February 12, 2009. During my tenure, I have gained extensive practical experience and theoretical knowledge in the operation and maintenance of various high-tech sophisticated laboratory equipment. My expertise with these instruments has enabled me to carry out various research projects and provide analytical services to researchers, postgraduate students, and industry clients. I can operate and interpret the data obtained from the listed instruments below.

i. Atomic Absorption Spectrometer (AAnlyst-700, Perkin Elmer, USA)

ii. Gas Chromatography (Clarus 500, Perkin Elmer, USA)

iii. Gas Chromatography Mass Spectrometry (Agilent 5977B GC/MSD, USA)

iv. High Performance Liquid Chromatography (200 Series, Perkin Elmer, USA)

v. Thermogravimetric/Differential Thermal Analyzer (Diamond TG/DTA, Perkin Elmer, USA)

vi. Differential Scanning Calorimeter (Diamond DSC, Perkin Elmer, USA)

vii. Surface Area & Pore Size Analyzer (2100e, Quantachrome, USA)

viii. Scanning Electron Microscope (JSM-5910, JEOL, Japan)

ix. Fourier Transform Infrared Spectroscopy (FTIR-8400, Shimadzu, Japan)

x. Uv/VIS-NIR (Lambda 1050+ , Perkin Elmer, USA)

xi. Zetasizer (ZSU3100, Malvern Panalytical, UK)

2: Member of the technical committee for the procurement of "Scientific Equipment for Advanced Research Lab (ARL)" University of Peshawar, since June 17 2019, to date.

Research interest

1) My research interests primarily focus on the synthesis and characterization of metal oxide particles and metal oxide-conducting polymers framework, specifically for gas sensing applications. I am particularly interested in investigating the properties and behavior of these materials, as well as exploring their potential for use in various environmental and industrial settings.

2) Another area of my research focuses on the application of organic wastes for the removal of heavy metal ions from contaminated water. I am interested in exploring the potential of various organic waste materials, such as agricultural waste and biowaste, as low-cost and environmentally friendly alternatives to conventional methods of water treatment. My research involves the development of novel adsorbents and the study of their adsorption mechanisms, as well as the optimization of operating conditions for their effective and efficient use.

Research Grants

I am currently leading a research project (Project No: 17228) titled "**Fabrication of noble metal decorated metal oxide based sensor for monitoring of human breath biomarkers**" funded by the Higher Education Commission of Pakistan under the National Research Program for Universities (NRPU). The objective of the project is to develop a highly sensitive and selective gas sensor for the detection and monitoring of biomarkers present in human breath.

Research Publications

1) S. Khan, H. Khan, A. Nasrullah, S. Ahmad, N. Muhammad, M. Bilal, F. U. Khan, S. Badshah, I. Ullah, **K. Malook** '' Antiwear Properties of Benzoic Acid in Bitter Rapeseed Oil and Sesame Oil at Low and High Temperature''International journal of Mechanical and Mechatronics Engineering, 12, 7-12, 2012.

2) M. Ikram, S. Rehman, M. Alic, Faridoon, C. Schulzkeg, R. J. Bakerd, A. J. Blakee, **K. Malook**, H. Wonge, S. U. Rehman, Urease and chymotrypsin inhibitory activities of transition metal complexes of new Schiff base ligand: Kinetic and thermodynamic studies of the synthesized complexes using TG–DTA pyrolysis, *Thermochimica Acta*, 562, 22– 28, 2013.

3) M. Sirajuddin, Nooruddin, S. Ali, V. McKee, S. Z. Khan, **K. Malook**, Synthesis, Spectroscopic Characterization, Crystal Structure, DNA Interaction Study and *in Vitro* Biological Screenings of 4-(5-chloro-2-hydroxyphenylamino)-4- oxobut-2-enoic acid, Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy, 134C:244-250, 2014.

4) I.U. Haq, K. Akhtar, **K. Malook**, Synthesis and characterization of monodispersed copper oxide and their precursor powder, Materials Research Bulletin, 57, 121–126, 2014.

5) K. Akhtar, I. U. Haq, **K. Malook**, Gas sensing properties of semiconducting copper oxide nanospheroids, Powder Technology 283, 505–511, 2015.

6) H. Khan, **K. Malook**, M. Shah, Highly selective and sensitive ammonia sensor using polypyrrole/V_2O_5 composites, Journal of Materials Science: Materials in Electronics, 28, 13873-13879, 2017.

7) **K. Malook**, H. Khan, M. Shah, I. Ul.Haque, Synthesis, characterization and electrical properties of polypyrrole/V_2O_5 composites, Korean Journal of Chemical Engineering, 35, 12–19, 2018.

8) H. Khan, **K. Malook**, M, Shah, Polypyrrole/MnO_2 composites: synthesis, structural and electrical Properties, Journal of Materials Science: Materials in Electronics, 29, 9090–9098, 2018.

9) **K. Malook**, H. Khan, M. Shah, I. Ul. Haque, Highly Selective and Sensitive Response of Polypyrrole–MnO_2 Based Composites towards Ammonia Gas, Polymer Composites, 40, 1676-1683, 2019.

10) **K. Malook**, I. Ul-Haque, M. Khan, M. Ali, Polypyrrole-CuO based composites, promotional effects of CuO contents on polypyrrole characteristics, Journal of Materials Science: Materials in Electronics, 30, 3882–3888, 2019.

11) H. Khan, **K. Malook**, M, Shah, Synthesis, characterization, and electrical properties of polypyrrole–bimetallic oxide composites, Journal of applied polymer science, 137, 47680, 2020, DOI:10.1002/app.47680.

12) **K. Malook**, I. Ul. Haque, Investigation of Aqueous Cr(VI) Adsorption Characteristics of Orange Peels Powder, Protection of Metals and Physical Chemistry of Surfaces, 55, 34-40, 2019.

13) **K. Malook**, H. Khan, M. Shah, I. Ul. Haque, Ammonia sensing behavior of Polypyrrole bimetallic oxide composites, polymer composites, 41, 2610-2615, 2020.

14) **K. Malook**, H. Khan, M. Ali, I. Ul. Haque, Investigation of room temperature humidity sensing performance of mesoporous CuO particles, Materials Science in Semiconductor Processing, 113, 105021, 2020.

15) **K. Malook**, H. Khan, Zero Valent Iron/Copper Functionalized Spent Tea as Adsorbent for Decontamination of Cd(II) Ions Contaminated Water, Water Science and Technology, 82, 2552–2561, 2020.

16) **K. Malook**, Orange peel powder, a potential adsorbent for Pb(II) ions removal from water, Theoretical Foundations of Chemical Engineering, 2021, 55, 518-526.

17) **K. Malook**, I. Ul. Haque Evaluation of essential and non-essential elemental composition of commonly used medicinal plants from district Peshawar, Khyber Pakhtunkhwa, Pakistan, Environmental Science, and Pollution Research, 64337-64344, 28, 2021.

18) **K. Malook**, M. Ali, I. Ul. Haque, Elucidation of room temperature humidity sensing properties of Mn_2O_3 particles, Applied Physics A 127:758, 2021.

19) Y. A. Shah, M. Shah, **K. Malook**, A. Khan, M. Ali, Fabrication and Characterizations of Ultra-Sensitive Capacitive/Resistive Humidity Sensor Based on CNT-Epoxy Nanocomposites, Journal of Materials Science (Accepted).

20) **K. Malook** et al, Ecofriendly synthesis of hydroxyapatite from fish scales and its application toward adsorptive removal of Pb(II), Journal of the Indian Chemical Society, 101, 101175, 2024.

21) **K. Malook**, H. Khan, M.Shah, I. Ul. Haque , A. Ahmad, Fabrication of Au-decorated V2O5 based sensor for ultra trace level detection of ammonia in an environment resembling human exhaled breath, Journal of Alloys and Compounds, Volume 1010, 5 January 2025, 177089.

22) **K. Malook** et al, Assessment of Physical Parameters and Potentially Toxic Elements in Municipal Water Distribution Systems, Journal of Hazardous Materials Advances, Volume 18, May 2025, 100694.

Abstracts in Conferences

1) Hamayun Khan, **K. Malook** and M. Shah, "Polypyrrol-MnO2 Composites: Synthesis, Characterization and Analytical Applications". 5th World Congress on Smart and Emerging Materials, 19-20th April 2018, at Dubai (UAE) (pp. 51).

2) Hamayun Khan, **K. Malook** and M. Shah, "Synthesis, Characterization and Analytical Applications of Polypyrrole/Bimetallic Oxide Composites". 5th International Multidisciplinary Research Conference, "Global Prosperity Through Research & Development", 29-31st October 2019, at Shaheed Benazir Bhutto Women University, Peshawar (Pakistan) (pp. 48).

(3) **K. Malook**, H. Khan, M. Shah, I. Ul.Haque, Synthesis, characterization and electrical properties of Polypyrrole /V_2O_5 composites "1st International Conference on Emerging Trends in Material Sciences, Center for Material Science, Islamia College Peshawar, Pakistan, 27th February to 1st March, 2018, (pp. 34).

Workshop/conference/training/seminars Attended

1) First one-week introductory workshop on CRL equipment, CRL, University of Peshawar, Pakistan, 15-20 June 2009 (**Resource person**).

2) 1st Training Course on "Application of Stable & Radioactive Isotopes in Food, Agriculture and Medicine, Nuclear Institute for Food & Agriculture (NIFA) Tarnab, Peshawar, Pakistan, October 5-9, 2009 (**Participant).**

3) Training Course of Analytical Equipment (HPLC, AAS, GC) by Analytical Measuring System (AMS) Pvt.Ltd (Perkin Elmer), February 8-12, 2010 (**Participant).**

4) Training Course of Analytical Equipment (DSC, TG/DTA, DMA) by Analytical Measuring System (AMS) Pvt.Ltd (Perkin Elmer), February 15-19, 2010 (Participated as Participant).

5) A two-day work shop on Vacuum and Thin Film Technology, National Centre for physics Quaid-e- Azam university Islamabad, Pakistan, 29-30 July 2010 (**Participant**).

6) 11th International & 23rd National Chemistry Conference, National Centre of Excellence In physical chemistry University of Peshawar, Pakistan, 15-17 October 2012 (**Participant).**

7) 4th Spring Research Poster Exhibition, Institute of Chemical Sciences, University of Peshawar, Pakistan, April 11, 2013 (**Presenter**).

8) 3 Days Indigenous On-Campus Training (IOT) on "Leaderships in Higher Education Institutes" Centre for Human Resource and Career Development, University of Peshawar, Pakistan, 31st August to 2nd September, 2016 (**Participant).**

9) Patent Drafting and Filing of Patent Application, Training and Development Centre, Islamia

College, Peshawar, Pakistan in Collaboration with Intellectual Property Organization of Pakistan, May 16, 2017 (**Participant).**

10) 1st International Conference on Emerging Trends in Material Sciences, Center for Material Science, Islamia College Peshawar, Pakistan, 27th February to 1st March, 2018, (**Presenter).**

11) Exhibited research facilities of CRL in the 26th Annual Technical Symposium & Exhibition of Oil and Gas industry of Pakistan, 19-20th November 2019 at Serena Hotel, Islamabad.

12) Joined three days training course on Operation, Maintenance & Calibration of Waters LC product, Alliance e2695 Separation Module, 2489 UV, Fraction Collector III, and Empower 3 software Under Kamstec Engineers at CRL from 26-29 April 2021.

13) Acted as an Organizer and Resource person in "one-week training workshop on CRL equipment" held from July 05th-9th, 2021, at Centralized Resource Laboratory, University of Peshawar.

14) Joined five days of training on "**Sample preparation, analysis, and data interpretation techniques specific for petroleum biomarkers**" at Hydrocarbon Development Institute of Pakistan (HDIP) Islamabad from October 30 to November 3, 2023.

Articles Reviewed

Reviewed article (s) for the following international journals;

1) Inorganic and Nano-Metal chemistry
2) ACS Omega
3) Sensors and Actuators B: Chemical
4) water science and technology

References

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2) Dr. Mutabar Shah, Associate Professor
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Languages

1. English, good speaking, listing, and writing
2. Urdu, good speaking, listing, and writing
3. Pashto, mother tongue