

Dr. Muhammad Mumtaz

Associate Professor (Tenured)

**Room No. 208, Department of Physics,
Faculty of Basic and Applied Sciences (FBAS),
Ibn-Al-Haythum Block, International Islamic
University (IIU), Sector H-10 Islamabad (44000),
Pakistan.**

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PERSONAL

Father's Name	Ghulam Qasim
Date & Place of Birth	May 04, 1975, Pakistan
CNIC #	61101-7899717-7
Passport #	AE0277173
Marital Status	Married
Nationality	Pakistani
Languages	English, Urdu, Saraiki and Punjabi.

ACADEMIC QUALIFICATION

Post Doc.

[**Physics** (Experimental Condensed Matter Physics)]

Ph. D.

[**Physics** (Experimental Condensed Matter Physics)]

M. Phil.

[**Physics** (Experimental Condensed Matter Physics)]
(First Division)

M. Sc.

Physics
(First Division)

B. Sc.

Physics, Maths. (A&B)
(First Division)

F. Sc.

Pre-Engineering
(First Division)

Matriculation

Science Group
(First Division)

July 01, 2012 – June 20, 2013

Institute of Physics (IOP) CAS, Beijing, China

April 27, 2004 – November 25, 2009

Quaid-i-Azam University, Islamabad, Pakistan

February 01, 2002 – February 26, 2004

Quaid-i-Azam University, Islamabad, Pakistan

September 20, 1995 – March 26, 1998

University of the Punjab, Lahore, Pakistan

September 15, 1992 – August 12, 1995

University of the Punjab, Lahore, Pakistan

July 15, 1990 – August 05, 1992

Board of Intermediate & Secondary Education,
Sargodha, Pakistan

March 01, 1988 – April 24, 1990

Board of Intermediate & Secondary Education,
Sargodha, Pakistan

B. Ed.

Teaching & Administration
(First Division)

March 01, 1998 – August 12, 2002

Allama Iqbal Open University, H-8 Islamabad,
Pakistan

RESEARCH INTERESTS

Experimental Condensed Matter Physics (Superconductivity and Nano-superconductor Composites)

M. Phil Thesis Title

“Characterization of $\text{Cu}_{1-x}\text{Tl}_x\text{Ba}_2\text{Ca}_2\text{Cu}_4\text{O}_{12-\delta}$ superconductor thin films”

Ph. D Thesis Title

“Synthesis and characterization of $\text{Cu}_{0.5}\text{Tl}_{0.5}\text{Ba}_2\text{Ca}_{n-1}\text{Cu}_{n-y}\text{Zn}_y\text{O}_{2n+4-\delta}$; $n = 3, 4$ superconductors”

Post Doc. Project Title

“Study of Quantum Phenomena in Mesoscopic Superconductors”

PROFESSIONAL EXPERIENCE

- ❖ Served for about **four (04)** years (from 14-05-1998 to 25-04-2002) as Lecturer (BPS-17) in Department of Physics, Army Public School and College (Boys) Lalazar, Rawalpindi, Pakistan.
- ❖ Served for about **eight (08)** years (from 27-04-2002 to 19-03-2010) as a Lecturer (BPS-17) in Department of Physics in Federal Government College (Men) F-10/4, Islamabad, Pakistan.
- ❖ Served for about **seven and half ($7\frac{1}{2}$)** years (from 22-03-2010 to 23-08-2017) as an Assistant Professor (TTS) in Department of Physics in International Islamic University, Islamabad, Pakistan.
- ❖ Worked **one (01)** year (1th July 2012 to 20th June, 2013) as International Young Scientist Fellow (Post Doc) at Institute of Physics (IOP) Chinese Academy of Sciences (CAS) Beijing, China.
- ❖ Presently, working as Associate Professor (Tenured) since 23th August 2017 in Department of Physics, International Islamic University Islamabad, Pakistan.

I am well-versed in the following courses at graduation level.

1. Materials Science (I & II)
2. Solid-State Physics (I & II)
3. Semiconductor Physics
4. Statistical Mechanics
5. Electrodynamics.
6. Quantum Mechanics.

7. Atomic & Molecular Physics
8. Experimental Techniques (I & II)
9. Classical Mechanics
10. Nano-structured Materials
11. Nano-structural Characterization Techniques
12. Advanced Mathematical Methods of Physics
13. Physics of superconductivity
14. Nano-science in superconductivity

RESEARCH EXPERIENCES

✚ Nearly **seven (07)** years research experience (from 2003 to 2010) in Material Science Laboratory, Department of Physics, Quaid-i-Azam University Islamabad, Pakistan, where I actively contributed in establishing the following characterization techniques during my M. Phil and Ph. D research work.

1. Samples preparation
2. Resistivity measurements
3. Critical current density measurements
4. Ac-susceptibility measurements
5. Fourier Transform Infrared (FTIR) absorption spectroscopy
6. Dielectric measurements
7. X-ray diffraction (XRD) and crystal structure analysis
8. X-ray Photoemission Spectroscopy (XPS).
9. Scanning Electron Microscopy (SEM) and EDX measurements.
10. Oxygen content determination

I am still involved in the process of developing rf & dc-sputtering systems for the deposition of thin films of superconductors and magnetic high-density storage materials.

✚ More than **seven and half ($7\frac{1}{2}$)** years research experience (20th March, 2010 to date) in Material Research Laboratory, Department of Physics, FBAS, International Islamic University, H-10 Islamabad, Pakistan.

✚ Worked about **one (01)** year (1th July 2012 to 20th June, 2013) as an International Young Scientist Fellow (Post Doc) at Institute of Physics (IOP) Chinese Academy of Sciences (CAS) Beijing 100084, China and got the following expertise during my stay at IOP in China.

1. I got expertise on the following latest experimental equipments/techniques

- (i) Physical Properties Measurement System (PPMS) manufactured by Quantum Design
- (ii) Hall Effect measurements
- (iii) Magnetron sputtering for superconducting thin films
- (iv) Ultraviolet photolithography
- (v) Electron-beam lithography for nano-structured superconducting thin films
- (vi) Pulse Laser Deposition (PLD) for the growth of superconducting thin films
- (vii) Scanning Electron Microscopy (SEM) and Electron Dispersive Spectroscopy (EDS)
- (viii) FTIR spectroscopy, etc

2. I got expertise on the following theoretical Models

- (i) Aslamazov–Larkin (AL) Model
- (ii) Lawrence–Doniach (LD) Model
- (iii) Maki–Thompson (MT) Model
- (iv) Kosterlitz–Thouless (KT) transition in 2D systems

3. I developed the International Collaborations with

- (i) Beijing National Laboratory of Condensed Matter Physics SC03 research group at Institute of Physics, Chinese Academy of Sciences, Beijing 100190 China.
- (ii) Department of Engineering Mechanics, Center for Nano and Micro Mechanics, Tsinghua University, Beijing 100089, China.

✚ Presently I am working (20th March, 2010 to Date) in Material Research Laboratory, Department of Physics, FBAS, International Islamic University, H-10 Islamabad, Pakistan.

NATIONAL/ INTERNATIONAL COLLABORATIONS

I have the following collaborations at National and International level

- ✓ Materials Science Laboratory, Department of Physics, Quaid-i-Azam University, Islamabad, Pakistan.
- ✓ Experimental Physics Labs, National Centre for Physics, Quaid-i-Azam University, Islamabad, Pakistan.
- ✓ Nano Science & Catalysis Division, National Center for Physics, Shadara Valley Road, Quaid-i-Azam University Campus, Islamabad 45320, Pakistan
- ✓ Institute of Physics, Chinese Academy of Sciences and Beijing National Laboratory of Condensed Matter Physics, Beijing 100190, China
- ✓ Department of Engineering Mechanics, Centre for Nano and Micro Mechanics, Tsinghua University, Beijing 100089, China

BS/MSc STUDENTS' RESEARCH PROJECTS SUPERVISED IN 2013~2017 AT DEPARTMENT OF PHYSICS, FBAS, IIUI

1. Group (BS 2014)

{Syed Muhammad Raza (01-FBAS/BSPHY/F10), Daniyal Hamza Mehdi (06-FBAS/BSPHY/F10), Syed Hussain Naazzar Bukhari (14-FBAS/BSPHY/F10), and Muhammad Moeed Awan (19-FBAS/BSPHY/F10)}

Project title: “Observation of Josephson Junctions like weak links behavior in nanoparticles/superconductor composites”

2. Group (BS 2015)

{Mr. M. Waqas-ur-Rehman (70-FBAS/BSPHY/S11), Mr. Shoaib Azeem (73-FBAS/BSPHY/S11) Mr. Saad Ullah (74-FBAS/BSPHY/S11) and Mr. Ahsan Akhtar (90-FBAS/BSPHY/S11)}

Project title: “Dielectric properties of (Zn)_y/CuTl-1223 nano-superconductor composites”

3. Group (BS 2016)

{Mr. Naseem Hassan (379-FBAS/BSPHY/S13), Mr. Moin Khan (382-FBAS/BSPHY/S13) Mr. Anas Mehmood (387-FBAS/BSPHY/S13) and Mr. Waqas Ahmed (386-FBAS/BSPHY/S13)}

Project title: “Intercomparison activation energy of (Ni,Co,Cr) nanoparticles added CuTl-1223 superconductor ”

4. Group (BS 2017)

{Mr. Mustehsin (518-FBAS/BSPHY/F13), Mr. Usama Tehseen (511-FBAS/BSPHY/F13) and Mr. Muhammad Ali (506-FBAS/BSPHY/F13) }

Project title: “Study of Dielectric Properties of Uncoated and Silica Coated Hematite (α -Fe₂O₃) nanoparticles”

5. Group (M.Sc.)

{Ejaz Ali (156-FBAS/MScPHY/S12), Ismail Ikram (161-FBAS/MScPHY/S12), and Muhammad Ahmed Khan (178-FBAS/MScPHY/S12)}

Project title: “Dielectric properties of (Ag)_y/CuTl-1223 nano-superconductor composites”

6. Group (M.Sc.)

{Sana Tariq (183-FBAS/MScPHY/S12), and Ayesha Iqbal (189-FBAS/MScPHY/S12)}

Project title: “Effects of silver nanoparticles addition on superconducting properties of CuTl-1223 matrix”

7. Group (M.Sc.)

{Anam Shah (132-FBAS/MScPHY/F11)}

Project title: “Noble metals (Ag, Au) nanoparticles addition effects on superconducting properties of CuTl-1223 phase”

8. Group (M.Sc.)

{Mr. Usman Sajid (165-FBAS/MScPHY/S12) and Mr. Zaheer Ahmed (193-FBAS/MScPHY/S12)}

Project title: “Dielectric properties of (NiFe₂O₄)_x/CuTl-1223 nano- superconductor composites”

9. Group (M.Sc.)

{Muhammad Naveed (224-FBAS/MScPHY/S13), Muhammad Imran (230-FBAS/MScPHY/S13), and Badshah Amin (162-FBAS/MScPHY/S13)}

Project title: “Dielectric properties of (ZnO)_y/CuTl-1223 nano-superconductor composites”

10. Group (M.Sc.)

{Mr. M. Naqqash Haider (345-FBAS/MScPHY/F13), Mr. Danyal Tayab (359-FBAS/MScPHY/F13), Mr. M. Junaid Asghar (364-FBAS/MScPHY/F13)}

Project title: “Comparison of superconducting transport properties of different magnetic nanoparticles-CuTl-1223 matrix”

11. Group (M.Sc.)

{Aftab Ahmed Khan (425-FBAS/MScPHY/S14)}

Project title: “Comparisons between Ni and Co ferrites/CuTl-1223 nanoparticles-superconductor composites”

MS STUDENTS SUPERVISED IN 2012-2017 AT DEPARTMENT OF PHYSICS, FBAS, IIUI

1. Mr. Muhammad Kamran (12-FBAS/MSPHY/F10)

Thesis title: “Metallic oxide nanoparticles addition effects on dielectric properties on CuTl-1223 superconductor”

2. Mr. Asif Iqbal Bhatti (19-FBAS/MSPHY/F10)

Thesis title: “Fluctuation induced inductivity of nanoparticles doped CuTl-1223 superconductor”

3. Mr. Muhammad Shahid (31-FBAS/MSPHY/F10)

Thesis title: “Dielectric and magnetic properties of CoZn-ferrite/SiO₂ nanocomposites”

4. Mr. Muhammad Imran (46-FBAS/MSPHY/F10)

Thesis title: “Effects of thickness of ZnSe thin films on their physical properties”

5. **Ms. Farrha Naeem** (39-FBAS/MSPHY/F10)
Thesis title: "Synthesis and characterization of metal oxide nanoparticles/superconductor composites"
6. **Mr. Zahir Usman** (3-FBAS/MSPHS/F10)
Thesis title: "Dielectric properties of Carbon nanotubes added CuTl-1223 superconductor"
7. **Mr. Abrar Ahmed Khan** (117-FBAS/MSPHY/F12)
Thesis title: "Berezinskii-Kosterlitz-Thouless (BKT) Transition in K-doped Fe-based superconductor"
8. **Mr. Munawar Zaman** (112-FBAS/MSPHY/F12)
Thesis title: "Effect of Al₂O₃ nanoparticles in CuTl-based superconductor"
9. **Mr. Ghulam Hussain** (111-FBAS/MSPHY/F12)
Thesis title: "Study of critical regime of (Ag)_x/CuTl-1223 nano-superconductor composites via excess conductivity analyses"
10. **Mr. Rafi Ullah** (128-FBAS/MSPHY/F12)
Thesis title: "Optimization of Al-doped ZnO nanorods for photovoltaic applications"
11. **Mr. Jaffer Saddique** (127-FBAS/MSPHY/F12)
Thesis title: "Synthesis and characterization of molybdenum oxide based nanostructures"
12. **Mr. Khalid Khan** (154-FBAS/MSPHS/S13)
Thesis title: "Inter-grain coupling effect on superconductivity of (Zn)_x/CuTl-1223 nano-superconductor composites"
13. **Mr. Ghulam Abbas** (238-FBAS/MSPHS/F13)
Thesis title: "Structural and dielectric properties of (Fe₂O₃)_x/CuTl-1223 nano-superconductor composites"
14. **Mr. Mian Adnan Asghar** (211-FBAS/MSPHS/F13)
Thesis title: "Localization effect on dielectric properties of (Ni)_x/CuTl-1223 nano-superconductor composites"
15. **Mr. Muhammad Waqas Rabbani** (268-FBAS/MSPHY/S14)
Thesis title: "Infield response of (Ag)_x /CuTl-1223 nanoparticles superconductor composites"
16. **Mr. Ibraheem** (224-FBAS/MSPHY/F13)
Thesis title: "Inter-grain coupling effect on superconducting properties of CuTl-1223 matrix by the addition of zinc nanoparticles"
17. **Mr. Khurram Shehzad** (235-FBAS/MSPHY/F13)
Thesis title: "Structural and dielectric properties of (Al₂O₃)_x/CuTl-1223 nanoparticles-superconductor composites"
18. **Mr. Sajid Ali** (270-FBAS/MSPHY/S14)
Thesis title: "Tuning of dielectric properties of CuTl-1223 matrix with cobalt (Co) nanoparticles"
19. **Mr. Irfan Ali** (236-FBAS/MSPHY/F13)
Thesis title: "Role of Cu nanoparticles in CuTl-1223 superconductors"
20. **Mr. Muhammad Touqeer** (287-FBAS/MSPHY/F14)
Thesis title: "Frequency dependent dielectric properties of (MnFe₂O₄)_x/CuTl-1223 nanoparticles-superconductor composites"
21. **Mr. Rashid khan** (307-FBAS/MSPHY/F14)
Thesis title: "Superconducting properties of (MnFe₂O₄)_x/CuTl1223 composites"
22. **Mr. Bilal Majeed** (272-FBAS/MSPHY/S14)
Thesis title: "Investigation on critical regime and pseudo-gap of (Fe₂O₃)_x/CuTl-1223 nanoparticles-superconductor composites via excess conductivity"
23. **Mr. Azhar Saeed** (310-FBAS-MSPHY/F-14)
Thesis title: "Theoretical analysis of excess conductivity in Cu-nanoparticles added CuTl-1223 superconductor"

24. Mr. Iftikhar Ahmad (255-FBAS/MSPHY/S14)

Thesis title: "Effect of MgO nanoparticles on superconducting properties of CuTl-1223 phase"

25. Mr. Ahmed Saleh Raja (302-FABS/MSPHY/F14)

Thesis title: "Tuning of dielectric parameters of CuTl-1223 superconductor by varying chromium (Cr) nanoparticles contents"

26. Muhammad Imran (369-FBAS/MSPHY/F15)

Thesis title: "Role of CoO nanoparticles in tuning the dielectric behavior of CuTl-1223 superconductor"

27. Waqas Ahmad (352-FBAS/MSPHY/F15)

Thesis title: "Infield superconducting properties of $(\text{Au})_x/\text{CuTl-1223}$ composites"

28. Badash Amin (366-FBAS/MSPHY/F15)

Thesis title: "Role of CoO Nanoparticles in Impedance of $\text{Cu}_{0.5}\text{Tl}_{0.5}\text{Ba}_2\text{Ca}_2\text{Cu}_3\text{O}_{10-\delta}$ Superconductor"

MS STUDENTS CO-SUPERVISED IN 2012~2014 AT DEPARTMENT OF PHYSICS IIUI

1. Ms. Sumayyah Naeem (41-FBAS/MSPHY/F10)

Thesis title: "Synthesis and characterization of ferrite nanoparticles/superconductor composites"

2. Mr. Faisal Jabber (18-FBAS/MSPHY/F10)

Thesis title: "Effects of irradiation of heavy ions on ZnSe thin films on their physical properties"

3. Mr. Faisal Zeb (53-FBAS/MSPHY/F10)

Thesis title: "Synthesis and characterization of Co-ferrite/ SiO_2 nanocomposites"

4. Mr. Adnan Razaq Qureshi (116-FBAS/MSPHY/F12)

Thesis title: "Temperature dependent magnetic properties of uncoated and coated cobalt ferrite nanoparticles"

5. Mr. Shahid Ahmed Khan (124-FBAS/MSPHY/F12)

Thesis title: "Study of cobalt ferrite nanoparticles/CuTl-based superconductor composites"

MS STUDENTS SUPERVISED IN 2012~2015 AT DEPARTMENT OF PHYSICS OF AIOU ISLAMABAD

1. Mr. Muhammad Arshad (AN710956) (Department of Physics, Allama Iqbal Open University, Islamabad, Pakistan)

Thesis title: "Fluctuation Induced Conductivity (FIC) analysis of Al_2O_3 nano-particles/CuTl-1223 superconductor composites"

2. Mr. Muhammad Tariq Saeed (AS751895) (Department of Physics, Allama Iqbal Open University, Islamabad, Pakistan)

Thesis title: "Synthesis and dielectric properties of magnesium-oxide nanoparticles"

PhD STUDENTS SUPERVISED IN 2010~2016 AT DEPARTMENT OF PHYSICS IIUI

1. Mr. Abdul Jabbar (01-FBAS/PhDPHY/S10)

Thesis Title: "Synthesis and characterization of metal-oxide nanoparticles added CuTl-based superconductor"

2. Mr. Irfan Qasim (10-FBAS/PhDPHY/S11)

Thesis Title: "Structural and superconducting properties of $\text{CuTl-12}(n-1)n$; $n = 3, 4$ /nanostructures composites"

3. Mr. Muhammad Waqee-ur-Rehman (12-FBAS/PhDPHY/F11)

Thesis Title: "Infield superconducting transport properties of magnetic nanostructures-CuTl-1223 composites."

BS/MSc STUDENTS RESEARCH PROJECTS UNDER SUPERVISION AT DEPARTMENT OF PHYSICS IIUI

1. Group (M.Sc.)

{Mr. Ahmed Jibraeel (734-FBAS/MScPHY/F16), Mr. Sharjeel Akhter (754-FBAS/BSPHY/F16) and Mr. Awais Khan (753-FBAS/BSPHY/F16) }

Project title: “Comparative dielectric study of Ferromagnetic Anti-ferromagnetic nanoparticles nanoparticles added CuTl-1223 superconductor”

MS STUDENTS UNDER SUPERVISION AT DEPARTMENT OF PHYSICS IIUI

1. Mr. Tanzeel Ul Rehman (372-FBAS/MSPHY/F15)

Thesis title: “Reduction of Jahn-Teller Distortion by Replacing Cu $3d^9$ with Zn $3d^{10}$ at CuO₂ Planes of CuTl-1223 Superconductor”

2. Mr. Muhammad Qasim (392-FBAS-MSPHY/S-16)

Thesis title: “Comparative Impedance Response of Ferromagnetic (Co) and Anti-ferromagnetic (Cr) Nanoparticles Added CuTl-1223 Superconductor”

3. Mr. Sheharyar Akhtar (397-FBAS/MSPHY/S16)

Thesis title: “Temperature Dependent Dielectric Modulus of (MnFe₂O₄)_x/CuTl-1223 Nanoparticles-Superconductor Composites”

4. Mr. Hassan Shannir (413-FBAS/MSPHY/S16)

Thesis title: “Infield Superconducting Properties of Mg-doped CuTl-1223 Phase”

5. Mr. Hassan Baig (420-FBAS/MSPHY/S16)

Thesis title: “Temperature Dependent Magnetic Properties of (CoO)_x/(CuTl-1223) Nanoparticles-Superconductor Composites”

MS STUDENTS UNDER Co-SUPERVISION AT DEPARTMENT OF PHYSICS OF FUUI

1. Mr. Abdul Rehman (7888APY/MPHILPHY/AUT-12) (Department of Physics, Federal Urdu University of Arts, Science and Technology, Islamabad, Pakistan)

Thesis title: “Fluctuation Induced Conductivity (FIC) analysis of (CoFe₂O₄)_x/CuTl-1223 nano-superconductor composites”

2. Mr. Muhammad Siddique (409APY/MPHILPHY/AUT-12) (Department of Physics, Federal Urdu University of Arts, Science and Technology, Islamabad, Pakistan)

Thesis title: “Excess conductivity analysis of nano-Au added CuTl-1223 superconducting matrix”

3. Mr. Raheel Ahmed (3151APY/MPHILPHY/AUT-12) (Department of Physics, Federal Urdu University of Arts, Science and Technology, Islamabad, Pakistan)

Thesis title: “Fluctuation Induced Conductivity (FIC) analysis of (NiO)_x/CuTl-1223 nano-superconductor composites”

Ph. D STUDENTS UNDER SUPERVISION AT DEPARTMENT OF PHYSICS IIUI

1. Mr. Liaqat Ali (37-FBAS/PhDPHY/F-14)

Thesis Title: “Metallic Nanoparticles Effects on Physical Properties of CuTl-1223 Superconductor”

2. Mr. Abrar Ahmed Khan (50-FBAS/PhDPHY/F-15)

Thesis Title: “Impedance Spectroscopy of Metallic Nanoparticles Added CuTl-based Superconductor

HONORS AND AWARDS

- I won “University Merit scholarship” in M. Phil.
- I won “University Merit scholarship” in Ph. D.
- I have been awarded “International Young Scientist Fellow (Post Doc)” at Institute of Physics (IOP) Chinese Academy of Sciences (CAS) Beijing, China
- I have been awarded the “Research Productivity Award” by the Pakistan Council for Science and Technology every year since 2009. Pakistan Council for Science & Technology (PCST) grants Research Productivity Award to active scientists on the basis of their publications in International Journals and their performance as evaluated empirically by Journal Impact Factors, Citations and Peer Review.

SKILLS

- Strong knowledge and research experience in high T_c superconductor in bulk form as well as in thin films and superconductor/nanostructure composites, proficient in preparation, characterization.
- Strong background of Materials science, synthesis and characterization
- Strong background of Materials Physics especially related to transport phenomenon in different materials
- Familiar with XRD, XPS, FT-IR, XRD, SEM, TEM, AFM, Raman Spectroscopy etc.
- Advanced English level skills and excellent abilities in search, tidying up and writing literatures for research.
- Excellent writing and communication skills.

REFERENCES

1. Dr. Nawazish Ali Khan

Professor of Physics (TTS)

Department of Physics, Quaid-i-Azam University, Islamabad.

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1. Prof. Xianggang Qiu

Professor of Physics

Group SC03, Beijing National Laboratory for Condensed Matter Physics,

Institute of Physics (IOP), Chinese Academy of Science (CAS),

Beijing 100190, China

E-mail: xgqiu@iphy.ac.cn

Ph.: 0086-10-82649444

LIST OF INTERNATIONAL PUBLICATIONS

(Total Impact Factor = 206.245)

1. Nawazish A. Khan, **M. Mumtaz**, K. Sabeeh, M. I. A. Khan, and. Mushtaq Ahmad, “The study of phonon modes of $\text{Cu}_{1-x}\text{Tl}_x\text{Ba}_2\text{Ca}_3\text{Cu}_4\text{O}_{12-y}$ superconductor thin films by FTIR absorption spectroscopy”, *Physica C* **407** (2004) 103-114. (I. F. = 1.404).
2. Nawazish A. Khan, and **M. Mumtaz**, “A New $\text{Cu}_{0.5}\text{Tl}_{0.5}\text{Ba}_2\text{Ca}_2\text{Cu}_{3-y}\text{Zn}_y\text{O}_{10-\delta}$ high-temperature superconductor with three ZnO_2 planes”, *Supercond. Sci. Technol.* **19** (2006) 762-766. (I. F. = 2.878).
3. Nawazish A. Khan, **M. Mumtaz**, M. M. Ahadian, and Azam Irajizad, “X-ray photo-emission studies of $\text{Cu}_{1-x}\text{Tl}_x\text{Ba}_2\text{Ca}_3\text{Cu}_4\text{O}_{12-y}$ superconductor thin films”, *Physica C* **449** (2006) 47-52. (I. F. = 1.404).
4. Nawazish A. Khan, **M. Mumtaz**, M. M. Ahadian, and Azam Irajizad, “X-ray photoemission studies of Zn doped $\text{Cu}_{1-x}\text{Tl}_x\text{Ba}_2\text{Ca}_3\text{Cu}_{3-y}\text{Zn}_y\text{O}_{10-\delta}$ ($y = 0, 2.65$) superconductors”, *Physica C* **453** (2007) 46-51. (I. F. = 1.404).
5. Nawazish A. Khan, and **M. Mumtaz**, “Absence of pair breaking effect in $\text{Cu}_{0.5}\text{Tl}_{0.5}\text{Ba}_2\text{Ca}_2\text{Cu}_{3-y}\text{Zn}_y\text{O}_{10-\delta}$ ($y=0, 0.75, 1.5, 2.25, 2.5, 2.65$) superconductor”, *Eur. Phys. J. Appl. Phys.* **38** (2007) 47-51. (I. F. = 0.684).
6. A. A. Khurram, **M. Mumtaz**, Nawazish A. Khan, M. M. Ahadian, and Azam Irajizad, “The effect of grain size on the fluctuation-induced conductivity of $\text{Cu}_{1-x}\text{Tl}_x\text{Ba}_2\text{Ca}_3\text{Cu}_4\text{O}_{12-y}$ superconductor thin films”, *Supercond. Sci. Technol.* **20** (2007) 742-747. (I. F. = 2.878).
7. Nawazish A. Khan, and **M. Mumtaz**, “ $\text{Cu}_{0.5}\text{Tl}_{0.5}\text{Ba}_2\text{Ca}_3\text{Cu}_{4-y}\text{Zn}_y\text{O}_{12-\delta}$ ($y=0, 1.0, 2.0, 3.0, 3.5$): Superconductor with four ZnO_2 planes”, *J. Low Temp. Phys.* **149** (2007) 97-103. (I. F. = 1.300).
8. **M. Mumtaz**, and Nawazish A. Khan, “Intergranular coupling of the $\text{Cu}_{0.5}\text{Tl}_{0.5}\text{Ba}_2\text{Ca}_2\text{Cu}_{0.5}\text{Zn}_{2.5}\text{O}_{10-\delta}$ superconductor”, *Supercond. Sci. Technol.* **20** (2007) 1228-1232. (I. F. = 2.878).
9. Nawazish A. Khan, and **M. Mumtaz**, “Enhanced superconductivity by Mg doping in $\text{Cu}_{1-x}\text{Tl}_x\text{Ba}_2\text{Ca}_{2-y}\text{Mg}_y\text{Cu}_{0.5}\text{Zn}_{2.5}\text{O}_{10-\delta}$ ”, *Mater. Lett.* **62** (2008) 659-662. (I. F. = 2.572).
10. Nawazish A. Khan, **M. Mumtaz**, and A. A. Khurram, “AC-susceptibility measurements of $\text{Cu}_{1-x}\text{Tl}_x\text{Ba}_2\text{Ca}_3\text{Cu}_4\text{O}_{12-y}$ superconductor thin films with different thallium content”, *Physica C* **468** (2008) 233–236. (I. F. = 1.404).
11. Nawazish A. Khan, and **M. Mumtaz**, “How Grain-Boundaries Influence the Intergranular Critical Current Density of $\text{Cu}_{1-x}\text{Tl}_x\text{Ba}_2\text{Ca}_3\text{Cu}_4\text{O}_{12-\delta}$ Superconductor Thin Films?”, *J. Low Temp. Phys.* **151** (2008) 1221-1229. (I. F. = 1.300).
12. Nawazish A. Khan, and **M. Mumtaz**, “Absence of pair-breaking mechanism in $\text{Cu}_{0.5}\text{Tl}_{0.5}\text{Ba}_2\text{Ca}_3\text{Cu}_{0.5}\text{Zn}_{3.5}\text{O}_{12-\delta}$ ”, *Phy. Rev. B* **77** (2008) 054507. (I. F. = 3.836).
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