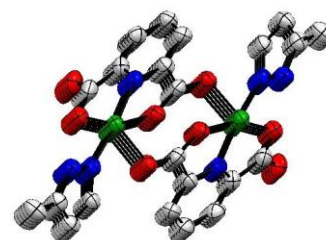




## Inorganic/Organometallic Chemistry



Dr. Ezzat Khan Completed PhD degree in the field of Inorganic/Organometallic Chemistry in 2009 under the Supervision of Prof. Dr. Bernd Wrackmeyer (late), University of Bayreuth, Bayreuth, Germany. He joined the University of Malakand as Assistant Professor since April 2009-Feb. 2018 and was promoted to Associate professor on Feb. 12, 2018. During his carrier he got **Four** research projects amounting PKR 5.00 m, 3.3 million and two projects < 0.5 m, funded by Higher Education Commission, Pakistan. He has been awarded Research Productivity Award (RPA) Five times by Pakistan Council of Science and Technology. His research group comprises PhD, MPhil/MS and BS students. The main focus of his research is Syntheses of Organometallic/Coordination compounds and their potential applications in the field of Bio-inorganic chemistry. He also has contributed in environmental chemistry and has produced several publications which focus on modern environmental challenges.

### Research Publications

1. Hazrat Ali, **Ezzat Khan** "Trophic transfer, bioaccumulation, and biomagnification of non-essential hazardous heavy metals and metalloids in food chains/webs—Concepts and implications for wildlife and human health" *Human and Ecological Risk Assessment. An International Journal*, **2019**, in press.
2. Hazrat Ali, Ezzat Khan, Muhammad Jamal Nasir, "Bioaccumulation of Some Potentially Toxic Heavy Metals in Freshwater Fish of River Shah Alam, Khyber Pakhtunkhwa, Pakistan" *Pakistan Journal of Zoology*, **2019**, in press
3. **Ezzat Khan**, Tufail Ahmad, Zarif Gul, Farhat Ullah, Muhammad Nawaz Tahir, Awal Noor "Methyl substituted 2-aminothiazole based cobalt(II) and silver(I) complexes; synthesis, X-ray structures and their biological activities" *Turk. J. Chem.*, **2019**, 43, 857-868.
4. Hazrat Ali, **Ezzat Khan**, Ikram Ilahi "Environmental chemistry and ecotoxicology of hazardous heavy metals: Environmental persistence, toxicity and bioaccumulation" *J. Chem.*, **2019**, 2019, 1-14, Article ID 6730305.
5. Hazrat Ali, **Ezzat Khan** "Bioaccumulation of Cr, Ni, Cd and Pb in the economically important freshwater Fish *Schizothorax plagiostomus* from three rivers of Malakand Division, Pakistan: Risk assessment for human health" *Bulletin of Environmental contamination and toxicology*, **2019**, 102, 77-83.
6. **Ezzat Khan**, Sher Ali Khan, Muhammad Zahoor, Muhammad Nawaz Tahir, Awal Noor, Ataf Ali Altaf "Cu(II) coordination polymers stabilized by pyridine-2,6-dicarboxylate anion and pyrazol derivatives through ligand hydrolysis" *J. Coord. Chem.* **2018**, 71(16-18), 2658-2673.
7. Sher Ali Khan, **Ezzat Khan**, Awal Noor, Stefan Schwarz, "Palladium(II) complexes based on N,S-donor ligands, synthesis and molecular structures" *J. Str. Chem.* **2019**, 60(1)166-173.
8. **Ezzat Khan**, Adnan Shahzad, Muhammad Nawaz Tahir, Awal Noor, "Antioxidant potential and secondary reactivity of bis{diphenyl(2-pyridyl)phosphino}copper(II) complex" *Turk. J. Chem.* **2018**, 42, 1299-1309.
9. Hazrat Ali, **Ezzat Khan** "Bioaccumulation of non-essential hazardous heavy metals and metalloids in freshwater fish. Risk to human health" *Environmental Chem. Lett.* **2018**, 16(3), 903-917.

10. Hazrat Ali, **Ezzat Khan** "Assessment of potentially toxic heavy metals and health risk in water, sediments, and different fish species of river Kabul Pakistan" *Human and Ecological Risk Assessment. An International Journal*, **2018**, 24(8), 2101-2118, <https://doi.org/10.1080/10807039.2018.1438175>.
11. Hazrat Ali, **Ezzat Khan** "What are heavy metals? Long-standing controversy over the scientific use of the term "heavy metals"—Proposal of a comprehensive definition" *Toxicol. Environ. Chem.* **2018**, 100(1), 6-19.
12. **Ezzat Khan**, Zarif Gul, Adnan Shahzad, Muhammad Saeed Jan, Farhat Ullah, Muhammad Nawaz Tahir, Awal Noor "Coordination compounds of 4,5,6,7-tetrahydro-1*H*-indazole with Cu(II), Co(II) and Ag(I); Structural, anti-microbial, anti-oxidant and enzyme inhibition studies" *J. Coord. Chem.* **2017**, 70(24), 4054-4069.
13. Haroon Ur Rashid, Adnan Shahzad, Zarif Gul, **Ezzat Khan**, Muhammad Naveed Umar, Muhammad Raza Shah, Awal Noor, Sher Wali Khan. "Facile synthesis, characterization and DFT calculations of 2-acetyl pyridine derivatives" *Quimica Nova*, **2017**, 40(8), 902-907.
14. Hazrat Ali, **Ezzat Khan**, "Environmental chemistry in 21<sup>st</sup> century" *Environ. Chem. Lett.*, **2017**, 15, 329-346.
15. Hanif Ahmad, Shujaat Ahmad, **Ezzat Khan**, Adnan Shahzad, Mumtaz Ali, Muhammad Nawaz Tahir, Farzana Shaheen, Manzoor Ahmad, "Isolation, crystal structure determination and cholinesterase inhibitory potential of isotalatizidine hydrate from *Delphinium denudatum*" *Pharmaceut. Bio.*, **2017**, 55, 680-686.
16. Shujaat Ahmad, Hanif Ahmad, Hidayat Ullah Khan, Adnan Shahzad, **Ezzat Khan**, Syed Adnan Ali Shah, Humera Naz, Manzoor Ahmad, "Crystal structure, phytochemical study and enzyme inhibition activity of Ajaconine and Delectinine" *J. Mol. Str.*, **2016**, 1123, 441-448.
17. Farhat Ali Khan, Muhammad Zahoor, **Ezzat Khan**, "Chemical and Biological evaluation of *Ranunculus Muricatus*" *Pak. J. Pharm. Sci.* **2016**, 29, 503-510.
18. Bernd Wrackmeyer, **Ezzat Khan**, "1,1-Carboboration Through Activation of Silicon–Carbon and Tin–Carbon Bonds" *Eur. J. Inorg. Chem.* **2016**, 300-312.
19. **Ezzat Khan**, Sher Ali Khan, Adnan Shahzad, Awal Noor, "Synthesis Characterization and DFT Calculations of 2,5-Substituted Thiophene Derivatives" *J. Chem. Crystallogr.* **2015**, 45, 238-243.
20. Ataf Ali Altaf, Adnan Shahzad, Zarif Gul, Sher A. Khan, Amin Badshah, Muhammad Nawaz Tahir, Zafar Iqbal Zafar, **Ezzat Khan**, "Synthesis, crystal structure and DFT calculations of 1,3-diisobutyl thiourea" *J. Chem.*, **2015**, 1-5, <http://dx.doi.org/10.1155/2015/913435>.
21. **Ezzat Khan**, Bernd Wrackmeyer, Rhett Kempe, Germund Glatz "Synthesis of 4-silaspiro[3.4]octa-1,5-diene derivatives; Hybrid spiro-compounds" *Appl. Organomet. Chem.* **2015**, 29, 384-391.
22. Sher Ali Khan, Awal Noor, Rhett Kempe, Hanif Subhan, Afzal Shah, **Ezzat Khan** "Syntheses, Molecular Structure and Electrochemical Investigations of Cobalt(II), Copper(II), Palladium(II) and Zinc(II) Complexes with 3-Methylpyrazole" *J. Coord. Chem.*, **2014**, 67(14), 2425-2434.
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24. **Ezzat Khan**, Oleg. L. Tok, Bernd Wrackmeyer, "Synthesis of 1-Silacyclopent-2-ene Derivatives using 1,2-Hydroboration, 1,1-Organoboration and Protodeborylation" *Appl. Organomet. Chem.*, **2014**, 28, 280-285.
25. **Ezzat Khan**, Umar Ali Khan, Amin Badshah, Muhammad Nawaz Tahir, Ataf Ali Altaf "Supramolecular Dithiocarbamatogold(III) Complex a Potential DNA Binder and Antioxidant Agent" *J. Mol. Str.*, **2014**, 1060, 150-155.

26. Hazrat Ali, **Ezzat Khan**, Muhammad Anwar Sajad "Phytoremediation of Heavy Metals- Concepts and Applications" *Chemosphere*, **2013**, 91(7), 869-881. (Top cited and most downloaded)
27. Zia-Ur-Rehman, Niaz Muhammad, Afzal Shah, Saqib Ali, **Ezzat Khan** "New Supramolecular Organotin(IV) Dithiocarboxylates as Potential Antibacterial Agents" *Heteroatom Chem.*, **2012**, 23(6), 560-567.
28. **Ezzat Khan**, Bernd Wrackmeyer. "Synthesis, NMR Characterization and reactivity of 1-silacyclohex-2-ene Derivatives" *Cent. Eur. J. Chem.* **2012**, 10(5), 1633.
29. **Ezzat Khan**, Bernd Wrackmeyer. "Synthesis and NMR Spectroscopic Characterization of Si-Substituted 1-Silacyclobutene Derivatives" *Cent. Eur. J. Chem.* **2011**, 9, 126-132.
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32. Bernd Wrackmeyer, **Ezzat Khan**, Stefan Bayer, Oleg L. Tok, Elena V. Klimkina, Wolfgang Milius, Rhett Kempe. "Alkynylsilanes and Alkynyl(vinyl)silanes. Synthesis, Molecular Structures and Multinuclear Magnetic Resonance Study" *Z. Naturforsch.* **2010**, 65b(6), 725-744.
33. Bernd Wrackmeyer, **Ezzat Khan**, Amin Badshah, Elias Molla, Peter Thoma, Oleg L. Tok, Wolfgang Milius, Rhett Kempe, Jürgen Senker. "Tetra(alkynyl)silanes, a 3,6-Disila-triayne, a 3,6,9-Trisila-tetrayne, a 1,3,4,6-Tetrasiladiyne, and Bis(trimethylstannyl)ethyne. Molecular Structures and Solid-State NMR Studies" *Z. Naturforsch.* **2010**, 65b(1), 119-126.
34. **Ezzat Khan** and Bernd Wrackmeyer. "Siloles Bearing Si-Vinyl and Si-Allyl Functions. 1,1-Organoboration and Protodeborylation" *Z. Naturforsch.* **2009**, 64b(10), 1098-1106.
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38. **Ezzat Khan**, Rhett Kempe and Bernd Wrackmeyer. "Synthesis and Molecular Structures of 1-Chloro-1-silacyclopent-2-enes. Combination of 1,2-Hydroboration, 1,1-Organoboration and Protodeborylation" *Appl. Organomet. Chem.* **2009**, 23(3), 124-131.
39. **Ezzat Khan**, Stefan Bayer and Bernd Wrackmeyer. "Reactivity of Triethylborane towards Di(alkyn-1-yl)(chloro)silanes. Competition between 1,1-Organoboration and 1,2-Hydroboration" *Z. Naturforsch.* **2009**, 64b(1), 47-57.
40. **Ezzat Khan**, Bernd Wrackmeyer and Rhett Kempe. "Combination of 1,2-Hydroboration and 1,1-Organoboration. A Convenient Route to New 5-Silaspiro[4,4]nona-1,6-diene Derivatives" *Eur. J. Inorg. Chem.* **2008**, (34), 5367-5372.
41. Bernd Wrackmeyer, **Ezzat Khan** and Wolfgang Milius. "1,2-Hydroboration of Alkyn-1-yl-dichlorosilanes using Triethylborane" *Z. Naturforsch.* **2008**, 63b(9), 1267-1275.
42. Bernd Wrackmeyer, **Ezzat Khan** and Rhett Kempe. "Synthesis and structure of novel spiro-silanes. Combination of 1,2-hydroboration and 1,1-organoboration" *Appl. Organomet. Chem.* **2008**, 22(7), 383-388.
43. Bernd Wrackmeyer, **Ezzat Khan** and Rhett Kempe. "Protodeborylation of triorganoboranes" *Z. Naturforsch.* **2008**, 63b(3), 275-279.

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45. Bernd Wrackmeyer, **Ezzat Khan** and Rhett Kempe. "1,2-Hydroboration of alkyn-1-yl(chloro)silanes. alkenes bearing chloros-ilyl and dialkylboryl groups in geminal positions" *Z. Naturforsch.* **2007**, 62b(1), 75-81.
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47. Bernd Wrackmeyer, **Ezzat Khan**, Stefan Bayer and Khadija Shahid. "Triethylborane: an "old" reagent with new functions. 1,2-hydroboration" *Z. Naturforsch.* **2007**, 62b(9), 1174-1182.

Contribution of the following scholars is graciously acknowledged in producing the above list of articles.

Name	Degree Awarded
1. <b>Dr. Sher Ali Khan</b>	PhD
2. <b>Dr. Adnan Shahzad</b>	PhD
3. <b>Dr. Hazrat Ali</b>	PhD
4. <b>Dr. Zarif Gul</b>	PhD
5. <b>Mr. Hazrat Ali</b>	M.Phil
6. <b>Mr. Umar Ali Khan</b>	-Do-
7. <b>Mr. Zarif Gul</b>	-Do-
8. <b>Mr. Muhammad Hanif</b>	-Do-
9. <b>Ms. Saima Ajmal</b>	-Do-
10. <b>Mr. Faizan Ur Rahman</b>	-Do-
11. <b>Ms. Rukhsana Zaib</b>	-Do-
12. <b>Mr. Abdul Waheed Kamran</b>	-Do-
13. <b>Mr. Nasrullah Khan</b>	-Do-
14. <b>Ms. Asma Amir</b>	-Do-
15. <b>Ms. Hasiba</b>	-Do-
16. <b>Mr. Alam Khan</b>	-Do-
17. <b>Ms. Basirat Taj</b>	-Do-
18. <b>Mr. Tufail Ahmad</b>	-Do-
19. <b>Mr. Sikandar Khan</b>	-Do-
20. <b>Mr. Ijaz Ahmad</b>	-Do-
21. <b>Mr. Abdullah Khan</b>	-Do-
22. <b>Ms. Maryam Bibi</b>	-Do-
23. <b>Ms. Aneela</b>	-Do-
24. <b>Ms. Iqrar</b>	-Do-