




## Faculty Details proforma for DU Web-site

Title	Prof./Dr./Mr./Ms./Mrs.	First Name	Firasat	Last Name	Hussain	Photograph
Designation		Assistant Professor				
Address		Department of Chemistry University of Delhi North Campus Delhi – 110 007				
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Email	<a href="mailto:fhussain@chemistry.du.ac.in">fhussain@chemistry.du.ac.in</a>					
Web-Page		<a href="http://people.du.ac.in/~firasat/">http://people.du.ac.in/~firasat/</a>				
<b>Educational Qualifications</b>						
Degree		Institution			Year	
Ph.D.		Jacobs University Bremen, Germany (Title: Synthesis of novel inorganic-organic hybrids of polyoxoanions based on organo tin moieties)			2006	
M.Phil. / M.Tech.		Utkal University, Bhubaneswar, Odisha			2000	
PG		Utkal University, Bhubaneswar, Odisha			1999	
UG		Govt. Science College, Bhawanipatna, Kalahandi (Sambalpur University, Odisha)			1997	
Any other qualification						
<b>Career Profile</b>						
1. Assistant Professor		University of Delhi			1 <sup>st</sup> Sept, 2010 - till date	
2. Postdoctoral Associate (SNSF-sponsored Fellow)		Institute of Inorganic Chemistry, University of Zurich, Switzerland			Sept, 2007 – Aug 2010	
3. Research Associate (ARC sponsored Fellow)		School of Chemistry, University of Melbourne, Australia			Aug, 2006 - Sept, 2007	
4. Ph.D.		Jacobs University Bremen, Germany			Apr 2003 - June 2006	
5. Research Assistant		Indian Institute of Technology, Bombay			Jan 2001 – Mar 2003	
<b>Administrative Assignments</b>						
1. Member, Academic Council, Delhi University – 2017 - 2019						
2. Resident Tutor, V.K.R.V. Rao Hostel, University of Delhi – Feb 2012 onwards						
3. Member – Seminar committee, 2013-14						
4. Served as member – Departmental Purchase committee, 2012						
5. Served as Deputy superintendent for M. Sc Examination – 2012 (Summer)						
6. Served as member flying squad for Examinations 2011 onwards						
<b>Areas of Interest / Specialization</b>						
Synthesis and characterization of Nano molecular cluster (Polyoxometalates, Nano materials, structural studies of Nano molecular clusters, catalysis, magnetism)						
<b>Subjects Taught</b>						
1. General Chemistry						
2. Synthesis and characterization of Nanomaterial						
3. Analytical Instrumentation (Ph.D. course)						
4. Biological and Ecofriendly methods for synthesis of Nanomaterial						
5. Inorganic Chemistry (Special-IV), Paper 4103 A & B (Analytical Techniques: Instrumentation & application)						
6. Inorganic Reaction Mechanism, Paper 301						

## Research Guidance

List against each head (If applicable)

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|--|-----|
| 1. Supervision of awarded Doctoral Thesis              | 04  |
| 2. Supervision of Doctoral Thesis, under progress      | 04  |
| 3. Supervision of awarded M.Tech dissertations         | 07  |
| 4. Supervision of M.Tech dissertations, under progress | Nil |

## Publications Profile

List against each head (If applicable) (as illustrated with examples)

**Patents:** Novel transition metal substituted polyoxometalates and process for their preparation. (Kortz U.; Hussain, F.; Mal, S. S.) **USSN11/655,593**, filled Jan 19, 2007.

### 1) Books/Chapters/Monographs (Authored/Edited)

- i) **Book Title:** Trends in Polyoxometalates Research: Synthesis and Characterization of Lanthanoid Containing Polyoxotungstates Nanocluster, Nova Science Publishers, Inc. Edited by L. Ruhlmann and Delphine Schaming, **ISBN:** 978-1-63482-693-8
- ii) **Book Title:** Advances in Chemistry Research: Inorganic-Organic Hybrid Polyoxometalates: Structural Diversity and Applications, Nova Science Publishers, Inc. Edited by James C. Taylor, **ISBN:** 978-1-53613-078-2.

### 2) Research papers published in Refereed/Peer Reviewed Journals

1. I. K. Pandey, M. Natarajan, H. Faujdar, **F. Hussain**, M. Stein, S. Kaur-Ghumaan, Intramolecular stabilization of a catalytic [FeFe]-hydrogenase mimic investigated by experiment and theory, *Dalton Trans.*, **2018**, 47, 4941-4949.
2. R. Gupta, S. Parbhakar, I. Khan, J. N. Behera, **F. Hussain\***, Early lanthanoid substituted organic-inorganic hybrids of silico-and germano-tungstates: Syntheses, crystal structures and solid-state properties, *Indian Journal of Chemistry*, **2018**, 57A, 52-58.
3. G. Kumar, **F. Hussain**, R. Gupta, Carbon-sulphur cross coupling reactions catalyzed by nickel-based coordination polymers based on metalloligands, *Dalton Trans.*, **2017**, 46, 15023.
4. R. Gupta, I. Khan, **F. Hussain\***, A. M. Bossoh, I. M. Mbomekalle, P. de Oliveira, M. Sadakane, C. Kato, K. Ichihashi, K. Inoue, S. Nishihara, Two New Sandwich-Type Manganese {Mn5}-Substituted Polyoxotungstates: Syntheses, Crystal Structures, Electrochemistry, and Magnetic Properties, *Inorg. Chem.*, **2017**, 56, 8759-8767.
5. R. Gupta, S. Parbhakar, J.N. Behera, **F. Hussain\***, Sandwich type organic-inorganic hybrid of 3d-4f heterometallic containing germanotungstates  $[\{Cu_2(1, 10\text{-phen})_2(\mu\text{-CH}_3\text{COO})_2\}Ln(\alpha\text{-GeW}_{11}\text{O}_{39})_2]^{11-}$ : Syntheses, crystal structures, magnetic and photoluminescence properties. *Inorg. Chem. Comm.*, **2016**, 74, 72-78.
6. R.K. Sharma, L.K. Gajanan, M.S. Mehata, **F. Hussain**, A. Kumar, Synthesis, characterization and fluorescence turn-on behavior of new porphyrin analogue: meta-benziporphodimethenes, *Spectrochimica Acta Part A: Mol. Biomol. Spect.* **2016**, 169, 58-65.
7. I.K. Pandey, M. Natarajan, **F. Hussain**, S. Kaur-Ghumaan\*, Diiron Complexes  $[Fe_2(CO)_5(\mu\text{-pdt}/\text{Mebdt})(L)]$  Containing a Chelating Diphosphine Ligand  $L=(\text{Oxydi-2, 1-phenylene})$  bis (diphenylphosphine): Bioinspired [FeFe] Hydrogenase Model Complexes. *ChemistrySelect.* **2016**, 1 (18), 5671-5678
8. S. Parbhakar, R. Gupta, J.N. Behera, **F. Hussain\***, Sandwich type organic-inorganic hybrid of silicotungstates :  $[\{Cu_2(1,10\text{-phen})_2(\mu\text{-CH}_3\text{COO})_2\}Ln(\alpha\text{-SiW}_{11}\text{O}_{39})_2]^{11-}$  {Ln = Pr<sup>III</sup>(1a), Nd<sup>III</sup>(2a), Sm<sup>III</sup>(3a), Eu<sup>III</sup>(4a), Gd<sup>III</sup>(5a) and Dy<sup>III</sup>(6a)}: Syntheses, crystal structures, photoluminescence and magnetic properties. *Inorg. Chem. Comm.* **2016**, 72, 117-121.
9. I. Khan, M.A. Tantray, H. Hamid, M.S. Alam, A. Kalam, **F. Hussain**, A. Dhulap, Synthesis of pyrimidin-

- 4-one-1, 2, 3-triazole conjugates as glycogen synthase kinase-3 $\beta$  inhibitors with anti-depressant activity. *Bioorganic Chemistry*, **2016**, 68, 41-55.
10. R. Gupta, **F. Hussain\***, M. Sadakane, C. Kato, K. Inoue, S. Nishihara, Lanthanoid Template Isolation of the  $\alpha$ -1, 5 Isomer of Dicobalt(II)-Substituted Keggin Type Phosphotungstates: Syntheses, Characterization, and Magnetic Properties. *Inorg. Chem.* **2016**, 55(17), 8292-8300.
  11. **F. Hussain\***, M. K. Saini, R. Gupta, S. Singh, Yttrium Containing Dimeric and Tetrameric Keggin Type Phosphotungstates: Syntheses, Crystal Structure and Catalytic Activity for Alcohol Oxidation Using H<sub>2</sub>O<sub>2</sub> as an Oxidant in Water, *Current Catalysis.*, **2016**, 5, 1, 66-76.
  12. M. Tantray, I. Khan, H. Hamid\*, M.S. Alam, S. Umar, Y. Ali, K. Sharma, **F. Hussain**, Synthesis of Novel Oxazolo[4,5-b]pyridine-2-one based 1,2,3-triazoles as Glycogen Synthase Kinase-3 $\beta$  Inhibitors with Anti-inflammatory Potential. *Chem. Bio. Drug Des.* **2016**, 918-926.
  13. I. Khan, M.A. Tantray, H. Hamid\*, M.S. Alam, A. Kalam, F. Shaikh, A. Shah, **F. Hussain**, Synthesis of Novel Pyrimidin-4-One bearing Piperazine Ring-Based Amides as Glycogen Synthase Kinase-3 $\beta$  Inhibitors with Antidepressant Activity. *Chem. Bio. Drug Des.* **2016**, 87(5), 764-772.
  14. R. Mathur\*, N. Bag, R. Varshney, **F. Hussain**, A. Kaul, N. Kumari, R. Chauhan, S. Singh, S. Singh, A.K. Mishra\*, Enhanced in vivo tumour imaging by EDTA-bis-GNGR functionalized core shell CdSe:ZnS quantum dot: Synergistic effect of active passive targeting. *RSC Adv.* **2016**, 6, 13562-13571.
  15. Y. Ali, M.S. Alam, H. Hamid, A. Husain, A. Dhulap, **F. Hussain**, S. Bano, C. Kharbanda, Molecular modeling and synthesis of some new 2-imino-4-thiazolidinone derivatives with promising TNF- $\alpha$  inhibitory activity. *New. J. Chem.* **2016**, 40, 711-723.
  16. A. S. H. Smith, J. Crisp, **F. Hussain**, G. R. Patzke, G. Hungerford, Use of Lanthanide-Containing Polyoxometalates to Sensitise the Emission of Fluorescent Labelled Serum Albumin. *ChemPhysChem.*, **2016**, 17, 418-424.
  17. Y. Ali, M. S. Alam, H. Hamid, A. Husain, S. Shafi, A. Dhulap, **F. Hussain**, S. Bano, C. Kharbanda, S. Nazreen, S. Haider, Design and Synthesis of Butenolide-based Novel Benzyl Pyrrolones: Their TNF- $\alpha$  based Molecular Docking with In vivo and In vitro Anti-inflammatory Activity. *Chemical Biology & Drug Design*, **2015**, 86, 4, 619-625.
  18. H.R. Talele, **F. Hussain**, A.V. Bedekar, Synthesis and Characterization of New Helical Coumarins. *Journal of Heterocyclic Chemistry.*, **2015**, 52 (3), 914-918.
  19. R. Gupta, **F. Hussain\***, J.N. Behera, A. M. Bossoh, I. M. Mbomekalle, P. Oliveira, Syntheses, crystal structure, electrochemistry and luminescence properties of lanthano-germanotungstates. *RSC Adv.*, **2015**, 5(121), 99754-99765.
  20. N. Bag, R. Mathur, **F. Hussain**, N. Indracanti, S. Singh, S. Singh, R. P. Chauhan, K. Chuttani, A. K. Mishra, Synthesis and in vivo toxicity assessment of CdSe: ZnS quantum dots functionalized with EDTA-Bis-Cysteamine. *Toxicology Research.*, **2015**, 4, 5, 1416-1425.
  21. M. K. Saini, R. Gupta, S. Singh, and **F. Hussain\***, Synthesis, crystal structure and catalytic activity of Guanidinium cation directed Nickel (II)-containing open Wells – Dawson 19-tungstodiarсенate (III) [Ni(H<sub>2</sub>O)<sub>4</sub>]<sub>2</sub>[Na(H<sub>2</sub>O)]As<sub>2</sub>W<sub>19</sub>O<sub>67</sub>(H<sub>2</sub>O)]<sup>9-</sup>. *RSC Advances.* **2015**, 5, 25273 – 25278.
  22. N. Bag, R. Mathur, S. Singh, **F. Hussain**, R. P. Chauhan, K. Chuttani, A. K. Mishra, Design, synthesis and evaluation of the QD-DTC-bisbiotin nanobioconjugate as a potential optical-SPECT imaging agent. *MedChemComm*, **2015**, 6, 2, 363-371.
  23. A. Debnath, **F. Hussain**, and D. T. Masram, Synthesis, characterization and antifungal studies of metalloquinolone [Cd<sub>2</sub>(nal)<sub>2</sub>(phen)<sub>2</sub>(Cl)<sub>2</sub>]. *Complex Metals: An Open Access Journal.*, **2014**, 96-102.
  24. R. Gupta, M. K. Saini, **F. Hussain\***, Syntheses, Crystal Structures and Solid-State Properties of the Lanthanoid-Containing Nanoclusters [(Ln<sub>2</sub>PW<sub>10</sub>O<sub>38</sub>)<sub>4</sub>(W<sub>3</sub>O<sub>8</sub>)(OH)<sub>4</sub>(H<sub>2</sub>O)<sub>2</sub>]<sup>26-</sup>. *European Journal of Inorganic Chemistry*, **2014** (35), 6031-6038.
  25. P. Kumar, S. Saravanan, N. Khan, **F. Hussain** and S. Singh, Chiral MnIII-salalen and -salan complexes derived from (S)-Pyrrolidin-2-ylmethanamine and Their catalytic activity in the asymmetric strecker reaction. *European Journal of Inorganic Chemistry.*, **2014**, 29, 5077-5083.

26. A. Debnath, **F. Hussain**, and D. T. Masram, Synthesis, Characterization, and Antifungal Studies of Cr(III) Complex of Norfloxacin and Bipyridyl Ligand. *Bioinorg. Chem. Appl.*, <http://dx.doi.org/10.1155/2014/457478>, **2014**.
27. D. Gupta, P. Rajakannu, B. Shankar, **F. Hussain**, M. Sathiyendiran, Synthesis and crystal structure of a wheel-shaped supramolecular coordination complex. *Journal of Chemical Sciences*, **2014**, *126* (5), 1501-1506.
28. S. Haider, M. S. Alam, H. Hamid, S. Shafi, A. Dhulap, **F. Hussain**, P. Alam, S. Umar, M.A.Q. Pasha, S. Bano, S. Nazreen, Y. Ali, C. Kharbanda, Synthesis of novel 2-mercaptobenzoxazole based 1,2,3-triazoles as inhibitors of proinflammatory cytokines and suppressors of COX-2 gene expression. *European Journal of Medicinal Chemistry.*, **2014**, *81*, 204-217.
29. P. Rathore, S. Syed Ovais, R. Bashir, R. Yaseen, A. D. Hameed, M. Samim, R. Gupta, **F. Hussain**, and K. Javed, Synthesis and evaluation of some new pyrazoline substituted benzene sulfonylureas as potential antiproliferative agents. *Bioorganic & Medicinal Chemistry Letters.*, **2014**, *24*, 1685-1691.
30. B. Shankar, S. Sahu, N. Deibel, D. Schweinfurth, B. Sarkar, P. Elumalai, D. Gupta, **F. Hussain**, G. Krishnamoorthy, and M. Sathiyendiran, (Luminescent Dirhenium(I)-Double-Heterostranded Helicate and Mesocate. *Inorg. Chem.*, **2014**, *53*, 922-30.
31. M. M. Cánaves, M. I. Cabra, A. Bauzá, P. Cañellas, K. Sánchez, F. Orvay, A. García-Raso, J. J. Fiol, A. Terrón, M. Barceló-Oliver, P. Ballester, I. Mata, E. Molins, **F. Hussain** and A. Frontera, Crystal structures and DFT calculations of new chlorido-dimethylsulfoxide-  $M^{III}$  ( $M = Ir, Ru, Rh$ ) complexes with the N-pyrazolyl pyrimidine donor ligand: Kinetic vs. thermodynamic isomers. *Dalton Transactions.*, **2014**, *43*, 6353-6364.
32. M. K. Saini, R. Gupta, S. Parbhakar, S. Singh, **F. Hussain\***, Lanthano-phosphotungstate: A water soluble and reusable catalyst for oxidation of alcohols using  $H_2O_2$  as an oxidant. *RSC Adv.*, **2014**, *4* (72), 38446-38449.
33. M. S. Chauhan, G. D. Yadav, **F. Hussain** and S. Singh, N-Fluorobenzenaminium tetrafluoroborate generated in situ by aniline and Selectfluor as a reusable catalyst for the ring opening of epoxides with amines under microwave irradiation. *Catalysis Science and Technology.*, **2014**, *4*, 3945-3952.
34. P. Yadav, S. Singh, S. N. Sahu, **F. Hussain** and R. Pratap, Microwave assisted base dependent regioselective synthesis of partially reduced chromenes, isochromenes and phenanthrenes. *Organic and Biomolecular Chemistry*, **2014**, *12*, 2228-2234.
35. R. Gupta, M. Saini, F. Dounghmene, P. de Oliveira, and **F. Hussain\***, Lanthanoid containing phosphotungstates: Syntheses, crystal structure, electrochemistry, photoluminescence and magnetic properties, *Dalton Trans.*, **2014**, *43* (22), 8290 - 8299.
36. M. K. Saini, R. Gupta, S. Parbhakar, A. K. Mishra, R. Mathur and **F. Hussain\***, Dimeric complexes of rare-earth substituted Keggin-type silicotungstates: Syntheses, crystal structure and solid state properties. *RSC Advances.*, **2014**, *4*, 25357-25364.
37. P. Rajakannu, P. Elumalai, **F. Hussain**, and M. Sathiyendiran, Rhenium-based bicyclic supramolecule with calixarene-shaped bowls. *J. Organomet. Chem.*, **2013**, *725*, 1-4.
38. P. Elumalai, P. Rajakannu, **F. Hussain**, and M. Sathiyendiran. Design strategy for arranging an aromatic cyclic trimer into a tripodal molecule, *RSC Adv.*, **2013**, *3*, 2171-2173.
39. B. Shankar, P. Elumalai, **F. Hussain**, and M. Sathiyendiran, Synthesis and characterization of tetragonal prismatic  $\pi$ -stacked metallacycles, *J. Organomet. Chem.*, **2013**, *732*, 130-136.
40. P. Rajakannu, P. Elumalai, B. Shankar, **F. Hussain**, and M. Sathiyendiran, Rhenium(I) based metallocalix[4]arenes decorated with free functionalized benzimidazolyl units, *Dalton Trans.*, **2013**, *42*, 11359-62.
41. B. Shankar, **F. Hussain**, and M. Sathiyendiran, Synthesis of rhenium-based  $M_3L_3L'$ -type metallacycle from benzimidazole and flexible tri(benzimidazole) ligands, *J. Organomet. Chem.*, **2012**, *719*, 26-29.
42. P. Rajakannu, **F. Hussain**, B. Shankar, and M. Sathiyendiran, Unprecedented single-crystal-to-single-crystal topochemical conformational change and photoreduction of ethylene units in  $\pi$ -stacked metallomacrocyclic. *Inorg. Chem. Commun.*, **2012**, *26*, 46-50.
43. D. Gupta, P. Rajakannu, B. Shankar, R. Shanmugam, **F. Hussain**, B. Sarkar and M. Sathiyendiran\*,

- Furan-decorated neutral Re(I)-based 2D rectangle and 3D trigonal prism, *Dalton Trans.*, **2011**, *40*, 5433-5435. (*Hot Article*).
44. P. Rajakannu, B. Shankar, A. Yadav, R. Shanmugam, D. Gupta, **F. Hussain\***, C. Chang, M. Sathiyendiran\*, and K. Lu\*, *Organometallics*, **2011**, *30* (11), 3168–3176.
  45. P. Rajakannu, **F. Hussain**, M. Sathiyendiran, 4, 4'-Bipyridine-3-(thiophen-3-yl)acrylic acid (1/2) *Acta Cryst.*, **2011**, *E67*, 02595.
  46. **F. Hussain\***, S. Sandriesser, M. Speldrich, and G. R. Patzke\*. A new series of lanthanoid containing Keggin-type germanotungstates with acetate chelators:  $[\{\text{Ln}(\text{CH}_3\text{COO})\text{GeW}_{11}\text{O}_{39}(\text{H}_2\text{O})\}_2]^{12-}$  {Ln = Eu<sup>III</sup>, Gd<sup>III</sup>, Tb<sup>III</sup>, Dy<sup>III</sup>, Ho<sup>III</sup>, Er<sup>III</sup>, Tm<sup>III</sup>, and Yb<sup>III</sup>}, *Journal of Solid State Chemistry*, **2011**, *184*, 214-219.
  47. S. Singh, M. K. Singh, A. Agarwal, **F. Hussain**, S.K. Awasthi, (2E)-1-(4-Aminophenyl)-3-(2, 4-dichlorophenyl) prop-2-en-1-one. *Acta Crystallographica Section E: Structure Reports Online* **67** (7), o1616-o1617.
  48. L. Ni, **F. Hussain**, B. Spingler, S. Weyeneth and G. R. Patzke\*, Lanthanoid- containing open Wells-Dawson silicotungstates: synthesis, crystal structure and properties, *Inorg. Chem.*, **2011**, *50*, 4944 – 4955.
  49. **F. Hussain\***, S. Sandriesser, M. Speldrich, and G. R. Patzke\*. A new series of lanthanoid containing Keggin-type germanotungstates with acetate chelators:  $[\{\text{Ln}(\text{CH}_3\text{COO})\text{GeW}_{11}\text{O}_{39}(\text{H}_2\text{O})\}_2]^{12-}$  {Ln = Eu<sup>III</sup>, Gd<sup>III</sup>, Tb<sup>III</sup>, Dy<sup>III</sup>, Ho<sup>III</sup>, Er<sup>III</sup>, Tm<sup>III</sup>, and Yb<sup>III</sup>}. *Journal of Solid State Chemistry*, **2011**, *184*, 214-219.
  50. **F. Hussain\*** and G. R Patzke.\* High-nuclear lanthanoid polyoxotungstates through self-assembly:  $[\text{Ln}_{16}\text{As}_{16}\text{W}_{164}\text{O}_{576}(\text{OH})_8(\text{H}_2\text{O})_{42}]^{80-}$  (Ln = Eu<sup>III</sup>, Gd<sup>III</sup>, Tb<sup>III</sup>, Dy<sup>III</sup>, and Ho<sup>III</sup>) *CrystEngComm.*, **2011**, *13*, 530.
  51. **F. Hussain\***, A. Degonda, S. Sandriesser, T. Fox, S. S. Mal, U. Kortz, G. R. Patzke. Yttrium containing head-on complexes of silico- and germanotungstate: Synthesis, structure and solution properties. *Inorganica Chimic Acta.*, **2010**, *363*, 4324 – 4328.
  52. G. Hungerford\*, **F. Hussain**, G. R. Patzke and M. Green, The photophysics of europium and terbium polyoxometalates and their interaction with serum albumin: a time-resolved luminescence study. *Phys. Chem. Chem. Phys.*, **2010**, *12*, 7266–7275.
  53. **F. Hussain\***, F. Conrad, and G. R. Patzke\*, A Gadolinium-Bridged Polytungstoarsenate(III) Nanocluster:  $[\text{Gd}_8\text{As}_{12}\text{W}_{124}\text{O}_{432}(\text{H}_2\text{O})_{22}]^{60-}$ . *Angew. Chem. Int. Ed.*, **2009**, *48*, 9088–9091.
  54. A. Deva, Jithin C. Mohan, V. Sreeja, H. Tamura, G. R. Patzke, **F. Hussain**, S. Weyeneth, S. V. Nair, R. Jayakumara\*, Novel carboxymethyl chitin nanoparticles for cancer drug delivery applications, *Carbohydrate Polymers*, **2009**, CARBPOL-D-09-00720R1.
  55. **F. Hussain**, B. Spingler, F. Conrad, M. Speldrich, P. Kögerler, C. Boskovic and G. R. Patzke\*. Caesium templated hexanuclear lanthanoid based polytungstoarsenate (III) clusters. *Dalton Trans.*, **2009**, 4423-4425.
  56. **F. Hussain**, C. Ritchie, R. W. Gable, B. Moubaraki, K. S. Murray and C. Boskovic\* . Tungstoarsenate(III) Polyoxoanions as Inorganic Ligands for Polynuclear Copper Complexes. *Polyhedron.*, **2009**, *28*, 2070–2074.
  57. E. F. C. Chimamkpan, **F. Hussain**, A. Engel, A. Schilling and G. R. Patzke\*. Synthesis and Characterization of Hybrid Materials Derived from Polyaniline and Lacunary Keggin-type Polyoxotungstates. *Z. Anorg. Allg. Chem.*, **2009**, *635*, 624-630.
  58. **F. Hussain**, R. W. Gable, M. Speldrich. P. Kögerler and C. Boskovic\*, Polyoxometalate encapsulated Gd<sub>6</sub> and Yb<sub>10</sub> complexes. *Chem. Commun.*, **2009**, 328-330.
  59. A. Michailovski, **F. Hussain**, B. Spingler, J. Wagler, and G. Patzke, \* Hydrothermal Strategies towards Polyoxofluoromolybdates(VI). *Cryst. Growth Des.*, **2009**, *9* (2), 755-765.
  60. G. A. Al-Kadamany, **F. Hussain**, S. S. Mal, M. H. Dickman, N. L. Laronze, J. Marrot, E. Cadot,\* and U. Kortz, \* Cyclic Ti<sub>9</sub> Keggin Trimers with Tetrahedral (PO<sub>4</sub>) or Octahedral (TiO<sub>6</sub>) Capping Groups. *Inorg. Chem.*, **2008**, *47*, 8574-8576.
  61. **F. Hussain**, B. S. Bassil, U. Kortz,\* O. A. Kholdeeva,\* P. de Oliveira, B. Keita and L. Nadjo\*, Di-Titanium Containing 19-Tungstodiarsenate(III)  $[\text{Ti}_2(\text{OH})_2\text{As}_2\text{W}_{19}\text{O}_{67}(\text{H}_2\text{O})]^{8-}$ : Synthesis, Structure, Electrochemistry and Oxidation Catalysis. *Chem. Eur. J.*, **2007**, *13*, 4733-4742.

62. **F. Hussain**, M. H. Dickman, U. Kortz\*, B. Keita, L. Nadjo, G. A. Khitrov, A.G. Marshall, Trimeric, Cyclic Dimethyltin-Containing Tungstophosphate  $[\{\text{Sn}(\text{CH}_3)_2\}(\text{Sn}(\text{CH}_3)_2\text{O})(\text{A-PW}_9\text{O}_{34})_3]^{21-}$ . *J. Clust. Sci.*, **2007**, *18*, 173-191.
63. K.-Y. Choi, Y. H. Matsuda, H. Nojiri\*, U. Kortz\*, **F. Hussain**, A. C. Stowe, C. Ramsey and N. S. Dalal\*, Observation of a Half Step Magnetization in the (Cu<sub>3</sub>)-Type Triangular Spin Ring. *Phys. Rev. Lett.*, **2006**, *96*, 107202-107204.
64. M. S. Alam, V. Dremov, P. Müller\*, S. S. Mal, **F. Hussain** and U. Kortz\*. STM/STS Observation of Polyoxoanions on HOPG Surfaces: The Wheel-shaped  $\text{Cu}_{20}\text{Cl}(\text{OH})_{24}(\text{H}_2\text{O})_{12}(\text{P}_8\text{W}_{48}\text{O}_{184})]^{25-}$  and the Ball shaped  $[\{\text{Sn}(\text{CH}_3)_2(\text{H}_2\text{O})\}_{24}\{\text{Sn}(\text{CH}_3)_2\}_{12}(\text{A-PW}_9\text{O}_{34})_{12}]^{36-}$ . *Inorg. Chem.*, **2006**, *45*, 2866-2872.
65. **F. Hussain**, U. Kortz\*, B. Keita, L. Nadjo\*, M. T. Pope. Tetrakis-Dimethyltin Containing Tungstophosphate  $[\{\text{Sn}(\text{CH}_3)_2\}_4(\text{H}_2\text{P}_4\text{W}_{24}\text{O}_{92})_2]^{28-}$ : First Evidence for Lacunary Preyssler Ion. *Inorg. Chem.*, **2006**, *45*, 761-766.
66. U. Kortz\*, **F. Hussain**, and M. Reicke. The Ball-Shaped Heteropolytungstates  $[\{\text{Sn}(\text{CH}_3)_2(\text{H}_2\text{O})\}_{24}\{\text{Sn}(\text{CH}_3)_2\}_{12}(\text{A-XW}_9\text{O}_{34})_{12}]^{36-}$  (X = P, As). *Angew. Chem. Int. Ed.* **2005**, *44*, 3773-3777.
67. **F. Hussain**, L. Bi, U. Rauwald, M. Reicke and U. Kortz\*. Structure and Solution Properties of the Cadmium(II)-Substituted Tungstoarsenate  $[\text{Cd}_4\text{Cl}_2(\text{B-}\alpha\text{-AsW}_9\text{O}_{34})_2]^{12-}$ . *Polyhedron*, **2005**, *24*, 847-852.
68. **F. Hussain** and U. Kortz\*. Polyoxoanions Functionalized By Diorganotin Groups: The Tetrameric, Chiral Tungstoarsenate(III),  $[\{\text{Sn}(\text{CH}_3)_2(\text{H}_2\text{O})\}_2\{\text{Sn}(\text{CH}_3)_2\}\text{As}_3(\alpha\text{-AsW}_9\text{O}_{33})_4]^{21-}$ . *Chem. Commun.*, **2005**, 1191-1193.
69. **F. Hussain**, M. Reicke, V. Janowski, S. deSilva, J. Futuwi, U. Kortz\*. Some Indium(III)-Substituted Polyoxotungstates of the Keggin and Dawson Type. *Comptes Rendus Chimie.*, **2005**, *8*, 1045-1056.
70. L. Bi, **F. Hussain**, U. Kortz\*, M. Sadakane, M. H. Dickman. A Novel Isopolytungstate Functionalized by Ruthenium:  $[\text{HW}_9\text{O}_{33}\text{Ru}^{\text{II}}_2(\text{dmsO})_6]^{7-}$ . *Chem. Commun.*, **2004**, 1420-1421.
71. **F. Hussain**, B. S. Bassil, L. Bi, M. Reicke, U. Kortz\*. Structural Control on the Nanomolecular Scale: Self-Assembly of The Polyoxotungstate wheel  $[\{\beta\text{-Ti}_2\text{SiW}_{10}\text{O}_{39}\}_4]^{24-}$ . *Angew. Chem. Int. Ed.*, **2004**, *43*, 3485-3488.
72. **F. Hussain**, U. Kortz\*, R. J. Clark. The Bis-Phenyltin Substituted, Lone Pair Containing Tungstoarsenate  $[\text{Na}(\text{H}_2\text{O})(\text{C}_6\text{H}_5\text{Sn})_2\text{As}_2\text{W}_{19}\text{O}_{67}(\text{H}_2\text{O})]^{7-}$ . *Inorg. Chem.*, **2004**, *43*, 3237-3241.
73. **F. Hussain**, M. Reicke, U. Kortz\*. Polyoxoanions Functionalized by Diorganotin Groups. 1. The Hybrid Organic-Inorganic 2-D material  $(\text{CsNa}_4[\{\text{Sn}(\text{CH}_3)_2\}_3\text{O}(\text{H}_2\text{O})_4(\beta\text{-XW}_9\text{O}_{33})].5\text{H}_2\text{O})$  (X =As<sup>III</sup>, Sb<sup>III</sup>) and its Solution Properties. *Eur. J. Inorg. Chem.*, **2004**, 2733-2738.
74. S. K. Mohapatra, **F. Hussain**, and P. Selvam\*. Synthesis, characterization, and catalytic properties of chromium-containing hexagonal mesoporous aluminophosphate molecular sieves. *Catal. Lett.*, **2003**, *85*, 3-4.
75. S. K. Mohapatra, **F. Hussain**, P. Selvam\*. Titanium substituted hexagonal mesoporous aluminophosphates: Highly efficient and selective heterogeneous catalysts for the oxidation of phenols at room temperature. *Catal. Commu.*, **2003**, *4*, 57-62.

Conference Organization/ Presentations (in the last three years)

#### Organization of a Conference:

1. Workshop on the progress of Academics and Industry in the Development of Nanotechnology, 18<sup>th</sup> and 19<sup>th</sup> of March **2013**. Convener, Organizing committee.
2. "Recent Trends in Nanoscience and Nanotechnology" during 15-16<sup>th</sup> Oct **2012**. Member, Organizing committee

#### Participation as Paper/Poster Presenter

R. Kaushik, S. Parbhakar and **F. Hussain\***, Synthesis and Characterization of lanthanoid substituted transition metal containing inorganic-organic hybrid polyoxometalates. Innovations in Sciences in

Emerging Challenges in Health and Environment (NSHE-2018), 20<sup>th</sup> March **2018**, Department of Chemistry, Daulat Ram College, University of Delhi. (**Best Poster Award**)

V. Das, I. Khan and **F. Hussain\***, Self-assembled heterometallic {Co<sub>7</sub>-Ho<sub>1</sub>} nanocluster: A 3d-4f trimeric Keggin-type silicotungstate [HoCo<sub>7</sub>Si<sub>3</sub>W<sub>29</sub>O<sub>108</sub>(OH)<sub>5</sub>(H<sub>2</sub>O)<sub>4</sub>]<sup>18-</sup> and its catalytic applications. National Conference on "Chemical Sciences: Opportunities & Challenges", 19<sup>th</sup>-20<sup>th</sup> March **2018**, Department of Chemistry, St. Stephen's College, University of Delhi. (**Best Poster Award**)

R. Kaushik and **F. Hussain\***, Synthesis and Characterization of Inorganic-Organic Hybrids of Transition Metal Substituted Arsenotungstates. National Conference on "Clean & Green Energy: The Chemical and Environmental Aspects (NCGE-2017)", 16<sup>th</sup>-17<sup>th</sup> Feb **2017**, Department of Chemistry, Bhaskaracharya College of Applied Sciences, University of Delhi.

V. Das and **F. Hussain\***, Synthesis and characterization of heterometallic 3d-4f Polyoxometalates containing Silicotungstates. National Conference on "Clean & Green Energy: The Chemical and Environmental Aspects (NCGE-2017)", 16<sup>th</sup>-17<sup>th</sup> Feb **2017**, Department of Chemistry, Bhaskaracharya College of Applied Sciences, University of Delhi.

I. Khan and **F. Hussain\***, Syntheses, crystal structure and solid state properties of lanthanoid containing nanocluster: [(Ln<sub>2</sub>SiW<sub>10</sub>O<sub>38</sub>)<sub>4</sub>(W<sub>3</sub>O<sub>8</sub>)(OH)<sub>4</sub>(H<sub>2</sub>O)<sub>2</sub>]<sup>26-</sup>. National Conference on "Clean & Green Energy: The Chemical and Environmental Aspects (NCGE-2017)", 16<sup>th</sup>-17<sup>th</sup> Feb **2017**, Department of Chemistry, Bhaskaracharya College of Applied Sciences, University of Delhi.

S. Parbhakar and **F. Hussain\***, Sandwich Type Organic – Inorganic Hybrid Silicotungstate: Synthesis, Crystal structure, and its Properties. 1<sup>st</sup> National conference on emerging trends and future challenges in chemical science (ETFC-KMC) 3<sup>rd</sup>-4<sup>th</sup> Jan **2016**, Conference center, University of Delhi. (**Best Poster Award**)

M. K. Saini and **F. Hussain\***, Yttrium containing nanocluster: Syntheses, crystal structure and its catalytic application in water using H<sub>2</sub>O<sub>2</sub> as a green oxidant, 2<sup>nd</sup> Indo-German Workshop on "SUPRAMOLECULAR CHEMISTRY" 30<sup>th</sup> March, **2015**, Department of Chemistry, University of Delhi, Delhi – 110007.

R. Gupta and **F. Hussain\***, Syntheses and crystal structure of Gadolinium containing nanocluster and application in magnetic resonance imaging (MRI) as a contrast agent, National Conference on "Frontiers at the Chemistry-Allied Sciences Interface", 13-14<sup>th</sup> March, **2015**, Department of Chemistry, University of Rajasthan, Jaipur, India.

R. Gupta and **F. Hussain\***, Syntheses and crystal structure of Gadolinium containing nanocluster and application in magnetic resonance imaging (MRI) as a contrast agent, 2<sup>nd</sup> Indo-German Workshop on "SUPRAMOLECULAR CHEMISTRY" 30<sup>th</sup> March, **2015**, Department of Chemistry, University of Delhi, Delhi – 110007. (**Best Poster Award**)

R. Gupta and **F. Hussain\***, Syntheses and crystal structure of Gadolinium containing nanocluster and application in magnetic resonance imaging (MRI) as a contrast agent, One day Symposium on "CURRENT TRENDS IN DRUG DISCOVERY RESEARCH IN INDIA" 11<sup>th</sup> April, **2015**, Department of Chemistry, School of Natural Sciences, Shiv Nadar University, India.

S. Parbhakar and **F. Hussain\***, Inorganic – Organic hybrid monovacant Keggin-type silicotungstate: synthesis, crystal structure, and its properties, One day Symposium on "CURRENT TRENDS IN DRUG DISCOVERY RESEARCH IN INDIA" 11<sup>th</sup> April, **2015**, Department of Chemistry, School of Natural Sciences, Shiv Nadar University, India.

R. Gupta and **F. Hussain\***, Syntheses, crystal structure and solid state properties of lanthanoid containing nanocluster:  $[(Ln_2PW_{10}O_{38})_4(W_3O_8)(OH)_4(H_2O)_2]^{26-}$ , **Mastering in Molecules and Materials (M<sup>3</sup>-2014)** organized by Department of Chemistry, National Institute of Technology, Kurukshetra, Haryana, Oct. 16-17, **2014. (Best Poster Award)**

M. K. Saini and **F. Hussain\***, A water-soluble lanthano-phosphotungstate polyoxometalates catalyst for oxidation of alcohols using H<sub>2</sub>O<sub>2</sub> as an oxidant, **Mastering in Molecules and Materials (M<sup>3</sup>-2014)** organized by Department of Chemistry, National Institute of Technology, Kurukshetra, Haryana, Oct. 16-17, **2014. (Best Poster Award)**

R. Gupta and **F. Hussain\***, Lanthanoid containing phosphotungstates nanocluster: Syntheses, crystal structure, electrochemistry, photoluminescence and magnetic properties, ONE DAY SEMINAR ON "NANOSCIENCE AND NANOTECHNOLOGY" 14<sup>th</sup> **March 2014**, Friday, M.Tech Nanoscience and Nanotechnology, University of Delhi, Delhi-110007.

R. Gupta and **F. Hussain\***, Lanthanoid containing phosphotungstates nanocluster: Syntheses, crystal structure, electrochemistry, photoluminescence and magnetic properties, ONE DAY SYMPOSIUM ON "EMERGING TRENDS IN TRANSLATIONAL RESEARCH IN INDIA", 12<sup>th</sup> **April 2014**, School of Natural sciences, Shiv Nadar University India.

M.M Singh, P. Kumar, F. Hussain, and S. Singh, Selectfluor as a reusable catalyst chemo- and regio-selective ring opening of epoxides with amines under microwave irradiations, 15<sup>th</sup> CRSI National Symposium in Chemistry held at BHU, Banaras on February 1-3, **2013**.

M. K. Saini and **F. Hussain\***, Dimeric rare earth substituted monovacant Keggin-type silicotungstates: Syntheses, crystal structure, and its solid state properties, 6<sup>th</sup> *Science Conclave 2013* "a congregation of Nobel Laureates and Eminent Scientists, an MHRD-DST initiative at IIT-Allahabad, Dec. 8-14, **2013**.

R. Gupta and **F. Hussain\***, Lanthanoid containing phosphotungstates: Syntheses, crystal structure, photoluminescence and magnetic properties", 6<sup>th</sup> *Science Conclave 2013* "a congregation of Nobel Laureates and Eminent Scientists, an MHRD-DST initiative at IIT-Allahabad, Dec. 8-14, **2013**.

R. Gupta and **F. Hussain\***, Lanthanoid containing phosphotungstates: Syntheses, crystal structure, photoluminescence and magnetic properties, "NEW DIRECTIONS IN CHEMICAL SCIENCES" (**NDCS-2012**), December 7-9, Department of Chemistry, IIT Delhi, New Delhi – 110016.

M. K. Saini and **F. Hussain\***, Dimeric rare earth substituted monovacant Keggin type silicotungstates: Syntheses, crystal structures, and its solid state properties "NEW DIRECTIONS IN CHEMICAL SCIENCES" (**NDCS-2012**), December 7-9, Department of Chemistry, IIT Delhi, New Delhi – 110016.

**F. Hussain\***, Resource person for National Level Seminar on "Chemistry in our Lives" on 24<sup>th</sup> August, **2011**, FM Autonomous College, Balasore for celebrating International Year of Chemistry, (Topic: Polyoxometalate as a diamagnetic host for molecular magnets).

**F. Hussain\***, B. Spingler, F. Conrad, M. Speldrich, P. Kögerler, C. Boskovic and G. R. Patzke, Synthesis and magnetic properties of high nuclear lanthanoid-containing polytungstoarsenate(III), 42<sup>nd</sup> **IUPAC Congress**, Glasgow, Scotland, 2-7 August, **2009**.

**F. Hussain**, L. Bi, B. Bassil and U. Kortz., *Discrete Polyoxoanions: Nanomolecular structures with Multiple*



*Functions, Extended Abstract-7<sup>th</sup> Norddeutsches Doktoranden- Kolloquium der anorganisch-chemischen Institute*, Organisation vom Institute fur Anorganische Chemie der Christian-Alberchts-Universitat zu Kiel, Hamburg, Germany, Sept 30-Oct 01, **2004**.

B. S. Bassil, **F. Hussain**, U. Kortz, S. Nellutla, A. C. Stove, N. S. Dalal., *Transition Metal Substituted Polyoxotungstates and Their Unique Magnetic Properties, Extended Abstract- Fourth International Conferences on Inorganic Materials*, University of Antwerp, Belgium, September 19-21, **2004**.

**F. Hussain**, L. Bi, B. Bassil and U. Kortz., *Discrete Polyoxoanions: Nanomolecular structures with Multiple Functions, Extended Abstract-7<sup>th</sup> International Conference on Nanostructured Materials*, Wiesbaden, Germany, June 20-24, **2004**.

**F. Hussain** and U. Kortz, *Novel Hybrids Of Inorganic-Organic Polyoxometalates*, 1<sup>st</sup> Open Graduate Students Conference, International University Bremen, Bremen. Germany, **2003**.

**F. Hussain** and P. Selvam., *Tertiary butylation of phenol over versatile solid acid catalysts H-GaMCM48, Extended Abstract-1<sup>st</sup> Indo-German Conference on Catalysis*, IICT-Hyderabad, Feb 6-8, **2003**.

#### Research Projects (Major Grants/Research Collaboration)

1. DST – SERB (Major, **2018 ongoing**)
2. DU-DST Purse Grant (Major, **2015 ongoing**)
3. DRDO-CARS Project on MRI (Major, **July 2012 – March 2014**) **Completed**
4. CSIR-Project (Major, ongoing **July 2013-2016**) **Completed**
5. DU: Strengthen R & D Doctoral Research Programme by providing funds to university faculty (3.0 Lac for year 2016)
6. DU: Strengthen R & D Doctoral Research Programme by providing funds to university faculty (2.8 Lac for year 2015)
7. DU: Strengthen R & D Doctoral Research Programme by providing funds to university faculty (2.5 Lac for year 2013-14)
8. DU: Strengthen R & D Doctoral Research Programme by providing funds to university faculty (2.5 Lac for year 2012)
9. DU: Strengthen R & D Doctoral Research Programme by providing funds to university faculty (2.5 Lac for year 2011)
10. DU: Strengthen R & D Doctoral Research Programme by providing funds to university faculty (2.5 Lac for year 2010)
11. 11 Misc.Grants and Contributions (13) Upgradation of teaching facilities for all the Departments. DU, Grant: Rs. 4.00 lakhs

#### Awards and Distinctions

1. Marquis Who's who VIP Number : 35570505
2. SNSF –Postdoctoral Associate
3. ARC – Research Associate
4. 1<sup>st</sup> position University for M.Phil. in Chemistry
5. IUB- fellowship to pursue Ph.D.

#### Association With Professional Bodies

1. Editing – Nil
2. Reviewing – International Journals
3. 3Advisory - Nil
4. Committees and Boards - Nil
5. Memberships – American Chemical Society 2010
6. Office Bearer
7. Maintenance Councilor, IIT- Bombay, Hostel – 1, **2002**.
8. Seminar Secretary M.Sc. – **1997 – 1999**.
9. Resident Tutor, V.K.R.V. Rao, University of Delhi – Feb 2012 onwards
10. Life member: Indian Society of Chemist and Biologist of India

#### Other Activities

##### **Invited talk /Resource person:**

1. "Recent Advances in Chemistry (RAC-2016)" organized by Department of Chemistry, Jamia Millia Islamia, New Delhi, April 26, **2016**. "Synthesis and characterization of yttrium containing polyoxometalates nanoclusters and its application in oxidation catalysis". (*Invited Lecture*)
2. "NATIONAL CONFERENCE ON RECENT ADVANCEMENTS IN CHEMICAL SCIENCES (**RAICS 2015**; 21<sup>st</sup> - 23<sup>rd</sup> August 2015)". "Synthesis and characterization of yttrium containing polyoxometalates nanoclusters and its application in oxidation catalysis".
3. "Recent Trends in Chemistry" organized by Department of Chemistry, St. Andrews College, Gorakhpur, India, **2013**. Lanthanoid containing polyoxometalates and its magnetic properties, (*Invited Lecture*)
4. UGC Sponsored Orientation Programme on Environmental Science: Polyoxometalates: A versatile nanomaterial for treatment of radioactive waste involving lanthanoids and actinides, **2013**. (*Resource Person*)
5. National Level Seminar on "Chemistry in our Lives" on 24th August, **2011**, FM Autonomous College, Balasore for celebrating International Year of Chemistry, (Topic: Polyoxometalate as a diamagnetic host for molecular magnets). (*Invited Lecture*)