

# *Curriculum Vitae*

Assistant Professor,  
Department of Chemistry, Science Block,  
National Institute of Technology (NIT-K),  
Surathkal, Mangalore-575025, India  
Email: [malss@nitk.edu.in](mailto:malss@nitk.edu.in); [malss@nitk.ac.in](mailto:malss@nitk.ac.in)

## Educational Qualification

- 10/2004 - 11/2008: **Doctor of Philosophy (Ph.D.)** at Jacobs University, Bremen, Germany,  
Research Group: Prof. Dr. Ulrich Kortz.  
Research Topic: *Synthesis and structural characterization with multiple analytical methods of Polyoxometalate Chemistry*
- 08/2001 - 08/2003: **Master of Science (M.Sc.)** at Indian Institute of Technology, Bombay, India,  
Research Topic: *Phosphorus Chemistry*
- 08/1998 - 08/2001: **Bachelor of Science (B.Sc.) in Chemistry**, Vidyasagar University, Kolkata.

## Professional Experience

- Since 11/2013: Assistant Professor at the National Institute of Technology (NIT-K) at Surathkal, India.
- 11/2011 - 10/2013: **Alexander von Humboldt Postdoctoral Research Fellow** at Hamburg University, Germany  
Research Group: Prof. Dr. Peter Burger  
Research Topic: *Redox-Active Transition Meta-Containing Ionic Liquids for use in Flow Batteries.*
- 01/2009 - 02/2011: **Postdoctoral Fellow** at Center for Catalysis Research and Innovation (CCRI), University of Ottawa, Ottawa, Ontario, Canada.  
Research Group: Prof. Dr. R.T. Baker  
Research Topics: *1. Development of Amine-Borane Fuels. 2. New Base Metal heterogeneous Catalysts for Sodium Borohydride hydrolysis.*

## **Courses Taught**

M.Sc : CY 755: Inorganic Chemistry Practical-I (Laboratory)  
: CY 701: Analytical Chemistry (Theory)  
: CY 705: Symmetry, Group Theory, and Quantum Theory  
: CY 804: Spectroscopy (Theory)  
: CY 861: Organometallic Chemistry (Theory)  
: CY 866: Bioinorganic Chemistry (Theory)  
: CY 863: Novel Inorganic Compounds (Theory)  
: CY 874: Environmental Chemistry (Theory)

B.Tech. : CY111: Chemistry Theory  
: CY110: Chemistry Lab  
: CY305: Inorganic and Physical Chemistry (Theory)

## **Administrative Duties**

1. The faculty advisor of first-year Post-graduate students.
2. Secretary of the Department of Undergraduate Committee (DUGC).
3. Member of the Department of Post-graduate Committee (DPGC).
4. Member of the Department of Research Proposal Committee (DRPC).
5. Secretary of the Departmental purchase committee.
6. Member of course timetable committee.

## **Supervised Students**

Completed: 1 (Ph.D.), 16 (Master students), 4 (Summer Students)

Ongoing: 4 (Ph.D.), 3(co-guide)

## **ORCID Profile**

<https://orcid.org/0000-0002-2520-4371>

**Scopus ID:** 8624485200

**Web of Science Researcher ID(s):** ABD-6882-2020

## **Membership**

1. ACS membership

## Publications List

**Total Citations =2114, h index = 24 i 10-index = 36**

1. Investigation of structural and physico-chemical properties of rice starch with varied amylose content: A combined microscopy, spectroscopy, and thermal study  
Indira Govindaraju, Guan-Yu Zhuo, Ishita Chakraborty, Sindhoora Kaniyala Melanthota, **Sib Sankar Mal**, Bhaswati Sarmah, Vishwa Jyoti Baruah, Krishna Kishore Mahato, Nirmal Mazumder\* *Food Hydrocolloids*, **2021**, 122, 107093 (I.F. 9.1)
2. Investigations into the Supercapacitor activity of bisphosphonate-polyoxovanadate compounds  
Anjana Anandan Vannathan, Dewendra Thakre, Sk Rajab Ali, Mrinmoy De, Abhishek Banerjee,\* **Sib Sankar Mal**\* *Journal of Solid State Chemistry*, **2021**, 304, 122566 (I.F. 3.5)
3. Organic Cation Linkers Polyoxomolybdate-Polypyrrol nanocomposite based supercapacitors  
Muhammed Anees P. K., Anjana Anandan Vannathan, Tatinaidu Kella, Debaprasad Shee, **Sib Sankar Mal**\* *Ionics*, **2021**, 27, 4023-4035. (I.F. 2.8)
4. Electrochemical performance of activated carbon-supported polyoxomolybdates electrodes for energy conversion  
Sukanya Maity, Anjana Anandan Vannathan, Tatinaidu Kella, Debaprasad Shee, Partha Pratim Das\* and **Sib Sankar Mal**\* *Ceramics International*, **2021**, 47, 27132-2741 (I.F. 4.5)
5. Activated Carbon-Supported Vanado-Nickelate (IV) Based Hybrid Materials for Energy Application  
Sukanya Maity, Neethu B. M., Tatinaidu Kella, Debaprasad Shee, Partha Pratim Das,\* and **Sib Sankar Mal**\* *Journal of Energy Storage* **2021**, 40, 102727 (I.F. 6.6)
6. One-pot synthesis of Polyoxometalate decorated polyindole for the high energy storage supercapacitors  
Anjana, Anandan Vannathan, Tatinaidu Kella, Debaprasad Shee, **Sib Sankar Mal**\* *ACS Omega* **2021**, 6(17), 11199-11208. (I.F. 3.5)
7. Recent advances in the preparation of levulinic esters from biomass-derived furanic and levulinic chemical platforms using heteropoly acid (HPA) catalysts  
Navya S Bhat, **Sib Sankar Mal**, Saikat Dutta\*, *Molecular Catalysis* **2021**, 505, 111484. (I.F. 5.062)
8. Decavanadate-Graphene oxide nanocomposite as an electrode material for electrochemical capacitance  
Sukanya Maity, Partha Pratim Das\*, and **Sib Sankar Mal**\* *Materials Technology: Advanced Performance Materials* **2021**, 1-11. (I.F. 2.7)
9. Enhanced power density of graphene oxide-phosphotetradecavanadate nanohybrid for supercapacitor electrode  
Sukanya Maity, Anjana Anandan Vannathan, Kiran, Partha Pratim Das\*, and **Sib Sankar Mal**\* *Journal of Materials Research and Performance*, **2021**, 30, 1371-1377. (I.F. 1.8)
10.  $[Et_3NH][HSO_4]$  as an Efficient and Inexpensive Ionic Liquid Catalyst for the Scalable, Solvent-free Preparation of Biorenewable Chemicals

- Navya Subray Bhat, **Sib Sankar Mal**, and Saikat Dutta\* *Biomass conversion and Biorefinery*, <https://doi.org/10.1007/s13399-020-01052-x>. (I.F. 4.987)
11. *Selective oxidation of Biomass-Derived Furfural to 2(5H)-Furanone using Trifluoroacetic Acid as Catalyst and Hydrogen Peroxide as Green Oxidant*  
Navya Subray Bhat, Rahul Kumar, Anukul Jana, **Sib Sankar Mal**, and Saikat Dutta\* *Biomass conversion and Biorefinery* DOI: [10.1007/s13399-021-01297-0](https://doi.org/10.1007/s13399-021-01297-0) (I.F. 4.987)
  12. *In situ vanadophosphomolybdate impregnated into conducting polypyrrole for supercapacitor*  
Anjana Anandan Vannathan, Sukanya Maity, Tatinaidu Kella, Debaprasad Shee, Partha Pratim Das, and **Sib Sankar Mal**\* *Electrochimica Acta*, **2020**, 364, 137268. (I.F. 6.9)
  13. *Redox-active vanadium-based polyoxometalate as an active element in resistive switching based nonvolatile molecular memory*  
Sterin N. S., Nivedita Basu, Marc Cahay, Satyanarayan M. N., **Sib Sankar Mal**\*, and Partha Pratim Das\* *physica status solidi (a) applications and materials science*, **2020**, 217(18), 2070053. (I.F. 1.98)
  14. *Microscopic and Spectroscopic Characterization of Rice and Corn Starch*  
Indira G., Sparsha P., Suchita U., **Sib Sankar Mal**, Guan-Yu Zhuo, K. K. Mahato, Nirmal Mazumder\* *Microscopy Research and Technique*, **2020**, 83 (5), 490-498. (I.F. 2.117)
  15. *Improved electrochemical performance of graphene oxide supported vanadomanganate (IV) nanohybrid electrode material for supercapacitors*  
Sparsha Kumari, Sukanya Maity, Anjana A. Vannathan, Debaprasad Shee, Partha Pratim Das,\* and **Sib Sankar Mal**\* *Ceramics International*, **2020**, 3, 3028-3035. (I.F. 4.5)
  16. *Efficient preparation of alkyl benzoates by heteropolyacid-catalysed esterification of benzoic acid under solvent-free condition*  
Ritesh Tiwari, Anoosha Rahman, Sharath Bandibairanahalli Onkarappa, **Sib Sankar Mal**\*, and Saikat Dutta\* *ChemistrySelect*, **2019**, 4, 9119-9123. (I.F. 2.109)
  17. *Width dependence of the  $0.5x(2e^2/h)$  conductance plateau in InAs quantum point contacts in presence of lateral spin-orbit coupling*  
Partha Pratim Das,\* Marc Cahay\*, Sashi Kalita, **Sib Sankar Mal**, Alok K. Jha, *Scientific Reports*, **2019**, 9 (1),12172. (I.F. 4.379)
  18. *A scalable and high-yielding synthesis of 2-(2-furyl)-1,3-dioxolane from biomass-derived furfural and ethylene glycol using heteropoly acids as green catalyst*  
Ritesh Tiwari, **Sib Sankar Mal**\*, and Saikat Dutta\* *Asian Journal of Chemistry*, **2019**, 31, 1599-1602.
  19. *Efficient and scalable production of alkyl levulinates from cellulose-derived levulinic acid using heteropolyacid catalysts*  
Sarath B. Onkarappa, Manjunath G. Javoor, **Sib Sankar Mal**\*, and Saikat Dutta\* *ChemistrySelect*, **2019**, 4, 2501-2504. (I.F. 2.109)
  20. *Polyoxovanadates inhibition of Escherichia coli growth shows a reverse correlation with  $Ca^{2+}$ -ATPase inhibition*  
Dorinda Marques-da-Silva, Gil Fraqueza., Lagoa, R., Anjana A. Vannathan, **Sib Sankar Mal**\* and Manuel Aureliano\*, *New Journal of Chemistry*, **2019**, 43, 17577-17587. (I.F. 3.288)
  21. *Inhibition of  $Na^+ / K^+ -ATPase$  activity from the basal membrane of the epithelia by phosphovanadate PV14*

- Gil Fraqueza, Juan Fuentes, Lulas Krivosudský, Saikat Dutta, **Sib Sankar Mal\***, Annette Rompel\* and Manuel Aureliano\*, *Journal of Inorganic Biochemistry*, **2019**, 197, 110700 (I.F. 3.348)
22. *Retention of high dielectric constant sodium beta alumina in solution combustion: role of aluminum ions complexation with urea, glycine and citric acid*  
Bikesh Gupta, Pavan Pujar, **Sib Sankar Mal**, Dipti Gupta, Saumen Mandal, *Ceramic International*, **2018**, 44, 1500-1511. (I.F. 4.5)
23. *Porous base-metal catalysts for alkaline-free sodium borohydride hydrolysis*  
Mehdi Mostajeran, Vanessa Prévot, **Sib Sankar Mal**, Emily Mattiussi, Boyd R. Davis, R. Tom Baker, *International journal of hydrogen energy*, **2017**, 42, 20092-20102. (I.F. 5.186)
24. *A Liquid Derivative of Phosphotungstic Acid as Catalyst for Benzyl Alcohol Oxidation in Water: Facile Separation and Stability of Benzaldehyde at Room Temperature*  
Rama Ranjan Bhattacharjee, Thangamani Suppan, **Sib Sankar Mal**, *ChemistrySelect*, **2017**, 2, 4368 – 4375. (I.F. 2.109)
25. *Dependence of the  $0.5x(2e^2/h)$  conductance plateau on the aspect ratio of InAs quantum point contacts with in-plane side gates*  
Partha Pratim Das, Alex Jones, Marc Cahay, S. Kalita, **Sib Sankar Mal**, N. Sterin, T. Yadunath, M. Advaita, Steve Herbert, *Journal of Applied Physics*, **2017**, 121, 083901. (I.F. 2.546)
26. *Characterization of Pt<sup>IV</sup>-containing Polyoxometalates by High-Resolution Solid-State <sup>195</sup>Pt and <sup>51</sup>V NMR Spectroscopy*  
S. Dugar, Nataliya V. Izarova, **Sib Sankar Mal**, Riqiang Fu, H. -C. Joo, Uk Lee, Naresh S. Dalal, Michael T. Pope, Geoff B. Jameson, Ulrich Kortz, *New J. Chem.*, **2016**, 40, 923-927. (I.F. 3.228)
27. *Electrocatalysis by crown-type polyoxometalates multi-substituted by transition metal ions: Comparative study*  
Naseer Rashda, **Sib Sankar Mal**, Ulrich Kortz, Gordon Armstrong, Fathima Laffir, Calum Dickinson, Mikhail Vagin, Timothy McCormac, *Electrochem. Acta*, **2015**, 176, 1248-1255. (I.F. 6.9)
28. *Redox, surface and electrocatalytic properties of layer-by-layer films based upon Fe(III)-substituted crown polyoxometalate  $[P_8W_{48}O_{184}Fe_{16}(OH)_{28}(H_2O)_4]^{20-}$*   
Rashda Naseera, **Sib Sankar Mal**, Masooma Ibrahim, Ulrich Kortz, Gordon Armstrong, Fathima Laffir, Calum Dickinson, Mikhail Vagin, Timothy McCormac, *Electrochem. Acta*, **2014**, 134, 450-458. (I.F. 6.9)
29. *Tetraalkylphosphonium Decavanadates: Synthesis, Structure and Solution Properties*  
**Sib Sankar Mal\***, Oliver Tröppner, Ivana Ivanović-Burmazović, Peter Burger, *Eur. J. Inorg. Chem.*, **2013**, 1960-1967. (I.F. 2.529)
30. *Dendri-POM Hybrids Based on Keggin, Wells-Dawson, Preyssler and Venturello Polyanions and Their Catalytic Activity in Oxidation Reactions*  
Claire Jahier, **Sib Sankar Mal**, Ulrich Kortz, Sylvain Nlate, *Polyhedron*, **2013**, 57, 57-63. (I.F. 2.108)

31. *Redox Switching of Polyoxometalate-Methylene Blue based Layer-by-Layer Films*  
Nargis Anwar, Mikhail Vagin, Rashda Naseer, Shahzad Imar, Masooma Ibrahim, **Sib Sankar Mal**, Ulrich Kortz, Fathima Laffir, Timothy McCormac, *Langmuir*, **2012**, 28, 5480-5488. (I.F. 3.557)
32. *Reactive Zr<sup>IV</sup> and Hf<sup>IV</sup> Butterfly Peroxide on Polyoxometalate Surfaces: Bridging the gap between Homogeneous and Heterogeneous Catalysis*  
Mauro Carraro, Nadeen H. Nsouli, Holger Oelrich, Andrea Sartorel, Antonio Sorarú, **Sib Sankar Mal**, Gianfranco Scorrano, Lorenz Walder, Ulrich Kortz, Marcella Bonchio, *Chem. Eur. J.*, **2011**, 17, 8371-8378. (I.F. 5.236)
33. *Alpha and Beta Isomers of Tetrahafnium(IV) Containing Decatungstosilicates, [Hf(OH)<sub>6</sub>(CH<sub>3</sub>COO)<sub>2</sub>(x-SiW<sub>10</sub>O<sub>37</sub>)<sub>2</sub>]<sup>12-</sup> (x = α, β)*  
Awatef S. Assran, **Sib Sankar Mal**, Natalya V. Izarova, Borislav Milev, Abhishek Banerjee, Andreas Suchopar, Masahiro Sadakane and Ulrich Kortz, *Dalton Trans.*, **2011**, 40, 2920-2925. (I.F. 4.05)
34. *Metal-Catalyzed Dehydrogenation of Amine-Borane Fuel Blends*  
**Sib Sankar Mal**, Frances H. Stephens, R. Tom Baker, *Chem. Commun.*, **2011**, 47, 2922-2924. (I.F. 5.996)
35. *Yttrium(III)-containing tungstoantimonate(III) stabilized by capping, tetrahedral WO<sub>4</sub><sup>2-</sup> unit, [Y(α-SbW<sub>9</sub>O<sub>31</sub>(OH)<sub>2</sub>)(CH<sub>3</sub>COO)(H<sub>2</sub>O)]<sub>3</sub>(WO<sub>4</sub>)<sup>17-</sup>*  
Masooma Ibrahim, **Sib Sankar Mal**, Bassem S. Bassil, Abhishek Banerjee, Ulrich Kortz, *Inorg. Chem.*, **2011**, 50, 956-960. (I.F. 5.165)
36. *Yttrium-containing Head-on Complexes of Silico- and Germanotungstate: Synthesis, Structure and Solution Properties*  
Firasat Hussain, Alois Degonda, Stefan Sandriesser, Thomas Fox, **Sib Sankar Mal**, Ulrich Kortz and Greta R. Patzke, *Inorg. Chim. Acta*, **2010**, 363, 4324-4328. (I.F. 2.046)
37. *Hexa-zirconium/hafnium-containing Tungstoarsenates(III) and their Oxidation Catalysis Properties*  
Ghada Al-Kadamany<sup>‡</sup>, **Sib Sankar Mal**<sup>‡</sup>, Borislav Milev, Baira Donoevap, Raisa Maksimovskaya, Oxana A Kholdeeva, Ulrich Kortz, *Chem. Eur. J.*, **2010**, 16, 11797-11800. (‡ - These authors contributed equally to this work) (I.F. 5.236)
38. *Unique Supramolecular Assembly of Wheel-Shaped Nanoscale Polyanions with a Hydrophobic Core*  
Jie Zhang, Tianbo Liu, **Sib Sankar Mal**, Ulrich Kortz, *Eur. J. Inorg. Chem.*, **2010**, 3195-3200. (I.F. 2.529)
39. *Cobalt, Manganese, Nickel, and Vanadium Derivatives of the Cyclic 48-Tungsto-8-Phosphate [H<sub>7</sub>P<sub>8</sub>W<sub>48</sub>O<sub>184</sub>]<sup>33-</sup>*  
Bassem S. Bassil, Masooma Ibrahim, **Sib Sankar Mal**, Andreas Suchopar, Rosa Ngo Biboum, Bineta Keita, Louis Nadjo, Saritha Nellutla, Johan van Tol, Naresh S. Dalal, Ulrich Kortz, *Inorg. Chem.*, **2010**, 49, 4949-4959. (I.F. 5.165)

40. *Dendritic Zirconium-Peroxo Tungstosilicate Hybrids: Synthesis, Characterization and Use as Recoverable and Reusable Sulfide Oxidation Catalysts*  
 Claire Jahier, **Sib Sankar Mal**, Ulrich Kortz and Sylvain Nlate, *Eur. J. Inorg. Chem.*, **2010**, 1559-1566. (I.F. 2.529)
41. *Peroxo-Zr/Hf Containing Undecatungstosilicates and -Germanates*  
**Sib Sankar Mal**<sup>†</sup>, Nadeen H. Nsouli<sup>†</sup>, Michael H. Dickman, Mauro Carraro, Andrea Sartorel, Gianfranco Scorrano, Marcella Bonchio and Ulrich Kortz, *Inorg. Chem.*, **2010**, 49, 7-9. (<sup>†</sup> - These authors contributed equally to this work) (I.F. 5.165)
42. *Synthesis and Crystal Structures of dmsO-Coordinated Tungstoantimonates(III) and Tungstobismutates(III)*  
 Li-Hua Bi, Guang-Feng Hou, Ya-Yan Bao, Bao Li, Li-Xin Wu, Zhong-Min Gao, Timothy McCormac, **Sib Sankar Mal**, Michael H. Dickman and Ulrich Kortz, *Eur. J. Inorg. Chem.*, **2009**, 5259-5266. (I.F. 2.529)
43. *The Wheel-Shaped Cu<sub>20</sub>-Tungstophosphate [Cu<sub>20</sub>X(OH)<sub>24</sub>(H<sub>2</sub>O)<sub>12</sub>(P<sub>8</sub>W<sub>48</sub>O<sub>184</sub>)]<sup>25-</sup> Ion (X = Cl, Br, I) and the Role of the Halide Guest*  
**Sib Sankar Mal**, Bassem S. Bassil, Ulrich Kortz, Saritha Nellutla, Johan van Tol, Naresh S. Dalal, Jorge A. Fernández, Xavier López, Josep M. Poblet, Rosa Ngo Biboum, Bineta Keita, *Inorg. Chem.*, **2009**, 48, 11636-11645. (I.F. 5.165)
44. *Preparation and Characterization of Langmuir-Blodgett films of Wheel-shaped Cu-20 Tungstophosphate and DODA by Two Different Strategies*  
 Ya-Yan Bao, Li-Hua Bi, Li-Xin Wu, **Sib Sankar Mal**, Ulrich Kortz, *Langmuir*, **2009**, 25, 13000-13006. (I.F. 3.882)
45. *Heterogeneous Wheel-shaped Cu<sub>20</sub>-tungstophosphate ([Cu<sub>20</sub>Cl(OH)<sub>24</sub>(H<sub>2</sub>O)<sub>12</sub>(P<sub>8</sub>W<sub>48</sub>O<sub>184</sub>)]<sup>25-</sup>): Catalyst for Solvent-free Aerobic Oxidation of n-Hexadecane*  
 Lifang Chen, Juncheng Hu, **Sib Sankar Mal**, Ulrich Kortz, Helge Jaensch, Georges Mathys, Ryan M. Richards, *Chem. Eur. J.*, **2009**, 15, 7490-7497. (I.F. 5.236)
46. *Actinide Polyoxometalates: Incorporation of Uranyl-Peroxo in U-Shaped 36-Tungsto-8-Phosphate*  
**Sib Sankar Mal**, Michael H. Dickman, Ulrich Kortz, *Chem. Eur. J.*, **2008**, 14, 9851-9855. (I.F. 5.236)
47. *Cyclic Ti<sub>9</sub>-Keggin Trimers with Tetrahedral (PO<sub>4</sub>) or Octahedral (TiO<sub>6</sub>) Capping Groups*  
 Ghada Al-Kadamany, Firasat Hussain, **Sib Sankar Mal**, Michael H. Dickman, Nathalie Leclerc-Laronze, Jérôme Marrot, Emmanuel Cadot, Ulrich Kortz, *Inorg. Chem.*, **2008**, 47, 8574-8576. (I.F. 5.165)
48. *Synthesis and Structural Characterization of the Yttrium-containing Isopolytungstate [YW<sub>10</sub>O<sub>36</sub>]<sup>9-</sup>*  
 Maria Barsukova, Michael H. Dickman, Elena Visser, **Sib Sankar Mal**, Ulrich Kortz, *Z. Anorg. Allg. Chem.*, **2008**, 634, 2423-2427. (I.F. 1.49)
49. *6-Peroxo-6-Zirconium Crown and its Hafnium-Analogue Embedded in a Triangular Polyanion: [M<sub>6</sub>(O<sub>2</sub>)<sub>6</sub>(OH)<sub>6</sub>( $\gamma$ -SiW<sub>10</sub>O<sub>36</sub>)<sub>3</sub>]<sup>18-</sup> (M = Zr, Hf)*

- Bassem S. Bassil, **Sib Sankar Mal**, Michael H. Dickman, Ulrich Kortz, Holger Oelrich, Lorenz Walder, *J. Am. Chem. Soc.*, **2008**, *130*, 6696-6697. (I.F. 15.42)
50. *Mixed-Valence 24-Vanadophosphate Decorated with Six Ru<sup>II</sup>(dmsO)<sub>3</sub> Groups:*  
 $[\{Ru^{II}_3(dmsO)_9PV^{V}_{11}V^{IV}Ru^{III}O_{37}(OH)_3\}_2]^{8-}$   
 Li-Hua Bi, **Sib Sankar Mal**, Nadeen H. Nsouli, Michael H. Dickman, Ulrich Kortz, Saritha Nellutla, Naresh S. Dalal, Manuel Prinz, George Hofmann, Manfred Neumann, *J. Clust. Sci.*, **2008**, *19*, 259-273. (I.F. 1.3)
51. *Pulsed-field Magnetization, Electron Spin Resonance, and Nuclear spin-lattice Relaxation in the {Cu<sub>3</sub>} Spin Triangle*  
 Kwang-Yong Choi, Naresh S. Dalal, Arneil P. Reyes, Philip L. Kuhns, **Sib Sankar Mal**, Ulrich Kortz, *Phys. Rev. B*, **2008**, *77*, 024406. (I.F. 4.036)
52. *Nucleation Process in the Cavity of a 48-tungstophosphate Wheel Resulting in a 16 Metal Center Iron-oxide Nanocluster*  
**Sib Sankar Mal**, Michael H. Dickman, Ulrich Kortz, Ana Maria Todea, Alice Merca, Hartmut Bögge, Thorsten Glaser, Achim Müller, Saritha Nellutla, Narpinder Kaur, Johan van Tol, Naresh S. Dalal, Bineta Keita, Louis Nadjo, *Chem. Eur. J.*, **2008**, *14*, 1186-1195. (VIP Article) (I.F. 5.236)
53. *Platinum-Containing Polyoxometalates*  
 Ulrich Kortz, Uk Lee, Hea-Chung Joo, Ki-Min Park, **Sib Sankar Mal**, Michael H. Dickman, G. B. Jameson, *Angew. Chem. Int. Ed.*, **2008**, *47*, 9383-9384. (I.F. 15.3)
54. *Facile Incorporation of Platinum(IV) into Polyoxometalate Frameworks: Preparation of [H<sub>2</sub>Pt<sup>IV</sup>V<sub>9</sub>O<sub>28</sub>]<sup>5-</sup> and First Evidence of <sup>195</sup>Pt NMR*  
 Uk Lee, Hea-Chung Joo, Ki-Min Park, **Sib Sankar Mal**, Ulrich Kortz, Bineta Keita, Louis Nadjo, *Angew. Chem. Int. Ed.*, **2008**, *47*, 793-796. (I.F. 15.3)
55. *Two Iron-Containing Tungstogermanates: [K(H<sub>2</sub>O)(β-Fe<sub>2</sub>GeW<sub>10</sub>O<sub>37</sub>(OH))(γ-GeW<sub>10</sub>O<sub>36</sub>)]<sup>12-</sup> and [β-Fe<sub>2</sub>GeW<sub>10</sub>O<sub>37</sub>(OH)<sub>2</sub>]<sub>2</sub><sup>12-</sup>*  
 Nadeen H. Nsouli, **Sib Sankar Mal**, Michael H. Dickman, Ulrich Kortz, Bineta Keita, Louis Nadjo, Juan M. Clemente-Juan, *Inorg. Chem.*, **2007**, *46*, 8763-8770. (I.F. 5.165)
56. *Organoruthenium Derivative of the Cyclic [H<sub>7</sub>P<sub>8</sub>W<sub>48</sub>O<sub>184</sub>]<sup>33-</sup> Anion: [K(H<sub>2</sub>O)]<sub>3</sub>{Ru(p-cymene)(H<sub>2</sub>O)}<sub>4</sub>P<sub>8</sub>W<sub>49</sub>O<sub>186</sub>(H<sub>2</sub>O)<sub>2</sub><sup>27-</sup>*  
**Sib Sankar Mal**, Nadeen H. Nsouli, Michael H. Dickman, Ulrich Kortz, *Dalton Trans.*, **2007**, 2627-2630. (With Inside Cover Picture) (I.F. 4.05)
57. *Wheel-Shaped Polyoxotungstate [Cu<sub>20</sub>Cl(OH)<sub>24</sub>(H<sub>2</sub>O)<sub>12</sub>(P<sub>8</sub>W<sub>48</sub>O<sub>184</sub>)]<sup>25-</sup> Macroanion Forms Supramolecular "Blackberry" Structure in Aqueous Solution*  
 Guang Liu, Tianbo Liu, **Sib Sankar Mal**, Ulrich Kortz, *J. Am. Chem. Soc.*, **2006**, *128*, 10103-10110 (Addition/Correction, **2007**, *129*, 2408-2408). (I.F. 15.42)
58. *STM/STS Observation of Polyoxoanions on HOPG Surfaces: The Wheel-shaped [Cu<sub>20</sub>Cl(OH)<sub>24</sub>(H<sub>2</sub>O)<sub>12</sub>(P<sub>8</sub>W<sub>48</sub>O<sub>184</sub>)]<sup>25-</sup> and the Ball-shaped [Sn(CH<sub>3</sub>)<sub>2</sub>(H<sub>2</sub>O)]<sub>24</sub>{Sn(CH<sub>3</sub>)<sub>2</sub>]<sub>12</sub>(A-PW<sub>9</sub>O<sub>34</sub>)<sub>12</sub><sup>36-</sup>*



- Mohammad S. Alam, V. Dremov, Paul Müller, Andrei V. Postnikov, **Sib Sankar Mal**, Firasat Hussain, Ulrich Kortz, *Inorg. Chem.*, **2006**, *45*, 2866-2872. (I.F. 5.165)
59. The Wheel-Shaped Cu<sub>20</sub>-Tungstophosphate [Cu<sub>20</sub>Cl(OH)<sub>24</sub>(H<sub>2</sub>O)<sub>12</sub>(P<sub>8</sub>W<sub>48</sub>O<sub>184</sub>)]<sup>25-</sup>, Redox and Electrocatalytic Properties  
Darine Jabbour, Bineta Keita, Louis Nadjo, Ulrich Kortz, **Sib Sankar Mal**, *Electrochem. Commun.*, **2005**, *7*, 841-847. (I.F. 4.72)
60. The Wheel-Shaped Cu<sub>20</sub>-Tungstophosphate [Cu<sub>20</sub>Cl(OH)<sub>24</sub>(H<sub>2</sub>O)<sub>12</sub>(P<sub>8</sub>W<sub>48</sub>O<sub>184</sub>)]<sup>25-</sup> Ion  
**Sib Sankar Mal** and Ulrich Kortz, *Angew. Chem. Int. Ed.*, **2005**, *44*, 3777-3780. (I.F. 15.3)

### **Conference Proceedings:**

1. The hydrogen peroxide-mediated oxidation of biorenewable furfural to 2 (5H)-furanone using heteropolyacids supported on ammonium Y zeolite as the catalyst  
Ritesh Tiwari, Navya S Bhat, **Sib Sankar Mal\***, Saikat Dutta\*, *Materials Today: Proceedings*, 2021, *46*, 3011-3017, <https://doi.org/10.1016/j.matpr.2020.12.1180>
2. Straightforward synthesis of calcium levulinate from biomass-derived levulinic acid and calcium carbonate in egg-shells  
Sharath B.O., Ritesh Tiwari, **Sib Sankar Mal**, and Saikat Dutta\* *Materials Today: Proceedings*, 2019, *17*, 77-84.
3. High-yielding synthesis of alkyl stearates from stearic acid within a closed batch reactor using heteropolyacids as efficient and recyclable catalyst  
Nivedha Vinod, Ritesh Tiwari, Navya Subray Bhat, **Sib Sankar Mal**, and Saikat Dutta\* *AIP Conference Proceedings* **2225**, 070004 (2020); <https://doi.org/10.1063/5.0005580>.
4. Microscopic and Spectroscopic Characterization of Elastomer for Microfluidics Application  
Soumyabrata Banik, N Pooja, Ishita Chakraborty, **Sib Sankar Mal**, K. K Mahato, Pornsak Srisungsitthisunti, Nirmal Mazumder, *Frontiers in Optics OSA Technical Digest (Optical Society of America, 2020)*, paper JTU1B.25
5. Microscopic and Spectroscopic Characterization of Elastomer for Microfluidics Application,  
S. Banik, P. N, I. Chakraborty, S. S. Mal, K. K. Mahato, P. Srisungsitthisunti, and N. Mazumder, in *Frontiers in Optics / Laser Science*, B. Lee, C. Mazzali, K. Corwin, and R. Jason Jones, eds., *OSA Technical Digest (Optical Society of America, 2020)*, paper JTU1B.25.

### **Awards and Fellowships**

1. Recipient of **Alexander von Humboldt** Postdoctoral Fellow
2. Recipient of **DFG** Fellowship for the PhD programme.
3. Recipient of **Madhav Pandya** Scholarship from IIT Bombay.

4. Recipient of GDCh Scholarship for '2nd EuCheMS Chemistry Congress' Program

### **Poster and Oral Presentations**

1. Oral Presentation: "*Synthesis and Magnetism of Multi-Transition Metal Containing Polyoxometalates*" in the **DFG conference on Magnetism of the transition metal complexes**, May 2005.
2. Poster Presentation: "*Synthesis and Structural Characterization of Transition Metal Substituted Polyoxoanions and Investigation of Their Unique Magnetic Properties*" in the **DFG conference on Magnetism of the transition metal complexes**, January 2006.
3. Poster and Oral presentation: "*Synthesis and Structure of Multi- Transition Metal-Substituted Wheel Shaped Polyoxotungstates*" in the **9<sup>th</sup> Northern-German Doctoral Student Colloquium of Inorganic Chemistry**, October 2006.
4. Poster Presentation: "*Recent Developments on Magnetic Polyanions*" in the **DFG conference on Magnetism of the transition metal complexes**, June 2007.
5. Poster Presentation: "*16-Iron Ring Grafted Inside the 48-Tungsten-8-Phosphate Template Wheel*" in **10<sup>th</sup> Northern-German Doctoral Colloquium of Inorganic Chemistry**, September 2007.
6. Poster and Oral presentation: "*Nucleation Process in the Cavity of a 48-Tungstophosphate Wheel resulting in a 16-Metal-Center Iron Oxide*" in '**2<sup>nd</sup> Euchems Chemistry Congress**' in Torino, Italy, September 16-20, 2008.
7. Oral presentation: "Transition Metal Catalyzed Dehydrogenation of *Sec*-Butylamine Borane" in '**93<sup>rd</sup> Canadian Chemistry Conference and Exhibition (CSC)**' in Toronto, Canada. 29<sup>th</sup> May - 2<sup>nd</sup> June 2010.
8. Poster presentation: "*New Base Metal Heterogeneous Catalysis for Sodium Borohydride Hydrolysis*" in '**H2CAN Workshop**' at Concordia University, Montreal, Quebec. August 19-20, 2010.
9. Oral Presentation: *Synthesis, Structure, and Properties of Multi-Transition "Metal-Substituted Wheel-Shaped Tungstophosphates"*, **International Conference on Multifunctional Materials for Future Applications**, IIT BHU, Varanasi, Oct 27-29, 2015.
10. Oral presentation: *Recent Development of organic transformation reactions using polyoxometalates as a potential catalysts*, NITK Surathkal, ChemFlash Programme, November 04, 2016.
11. Oral presentation: *Synthesis and chracterization of graphene oxide-polyoxometalate composite material for device applications*, **4th National Conference on Condensed Matter Physics and Applications**, Manipal University, Karnataka, INDIA, May 23-24, 2016
12. Poster presentation: *Variational Calculation of Exciton Energy in Spherical Quantum Well*, **4th National Conference on Condensed Matter Physics and Applications**, Manipal University, Karnataka, INDIA, May 23-24, 2016.
13. Poster presentation: Oxidation of Bio-mass derived 5-Chloromethylfurfural (CMF) to 2, 5-Diformylfuran (DFF), **International conference on emerging trends in chemical sciences**, Department of Chemistry, Manipal Institute of Technology, Manipal, September 14<sup>th</sup>-16<sup>th</sup>, 2017.

14. Poster presentation: *Graphene oxide-polyoxometalate composite materials for energy harvesting*, **International Conference on Recent Advance in Materials Science and Biophysics**, University of Mangalore, Karnataka, INDIA, January 23-25, 2018.
15. Poster presentation: *Resistive Switching in Na<sub>6</sub>V<sub>10</sub>O<sub>28</sub> polyoxometalates Thin Film Based Two Termina; Device*, **International Conference on Recent Advance in Materials Science and Biophysics**, University of Mangalore, Karnataka, INDIA, January 23-25, 2018
16. Poster Presentation: *Heteropolyacids as homogeneous catalysts for the esterification of levulinic acid*, **International conference on nanomaterials and their applications**, University of Mysore, Karnataka, INDIA, March 1-2, 2018.
17. Poster Presentation: *Polyoxovanadate as a new hybrid material for the electrode in electrochemical supercapacitors*, **International Conference on Advanced Materials (ICAM)**, Centre for Nanoscience and Nanotechnology (CNN) and Jamia Millia Islamia (A Central University), Delhi, INDIA, March 6-7, 2019.
18. Poster Presentation: Title: **International Conference on Advances in Chemical and Material Science**, Department of Chemistry, Mangalore University, October 2019.
19. Oral presented: Title: **International Conference on “Energy and Environmental Technologies for Sustainable Development (CHEM-fulx20)**, MNNIT Allahabad, Prayagrah, February 14-15, 2020.
20. Paper Presentation: Sustainable and Green Technologies session in an International Conference on **Energy and Environmental Technologies for Sustainable Development (CHEM-fulx20)**, MNNIT Allahabad, Prayagrah, February 14-15, 2020.
21. Poster Presentation: *Activated Carbon Fabricated from Cow Dung Supported Polyoxomolybdate Electrode Material for Electrochemical Applications*, **6<sup>th</sup> International Conference on Nanoscience and Nanotechnology (ICONN)**, SRM Institute of Science and Technology, Kattankulathur, February 1-3, 2021.
22. Oral Presentation: Sterin N S, Nivedya T, Sukanya Maity, Bhimaraya R B, Sib Sankar Mal and Partha Pratim Das, **Resistive Switching in Redox Active Vanadium Based Polyoxometalate (Na<sub>6</sub>V<sub>10</sub>O<sub>28</sub>) for RRAM Devices**, at International Conference on Functional Materials and Applied Physics (FMAP-2021), S. V. National Institute of Technology, Surat-395 007. Gujarat, India. May 14-15, 2021.

### **Invited Talks:**

1. International Webinar on Advances in Physics, Chemistry, Mathematics, Computer Sciences & Biological Sciences (CONIAPS XXVI), organized by Mahatma Gandhi University, Kottayam, Kerala & International Academy of Physical Sciences (IAPS), Allahabad, 18-20 December 2020.

### **Patents**

1. A high-performance supercapacitor device of polyaniline-triethyl amine ionic liquid combined phosphomolybdate electrode and method thereof (Sib Sankar Mal, Saikat Dutta, Anjana

- Anandan Vannathan, Muhammed Anees P K), Filed **India patent** application no. 202141007885 dated 24/02/2021
2. Method of preparation of high energy density conducting polyaniline-phosphovanadomolybdate nanohybrid electrode for supercapacitor device application (Sib Sankar Mal and Anjana Anandan Vannathan), Filed **India patent** application no. 202041047069 dated 03/11/2020.
  3. Method of preparation of activated carbon-supported vanado-nickelate (IV) nanohybrid - electrode for high-performance supercapacitors device application (Sib Sankar Mal, Partha Pratim Das, Sukanya Maity, and Neetu B M.), Filed **India patent** application no. 202041047070 dated 03/11/2020.
  4. Efficient production of furanics and levulinic acid from carbohydrates in aqueous hydrochloric acid using quaternary ammonium salt as surfactant (Saikat Dutta, Navya Subray Bhat, Sarath B. O., Sib Sankar Mal ) Filed (Application ID 202041007329, dated 11/06/2020).
  5. Transition Metal Substituted Polyoxometalates and Process for their Preparation (Ulrich Kortz, Sib Sankar Mal), US 7,820,868 B2
  6. Transition Metal Substituted Polyoxometalates and Process for their Preparation (Ulrich Kortz, Sib Sankar Mal), US 7,645,907 B2