Dr. Tapas Kumar Mandal
Assistant Professor
Department of Chemistry
Indian Institute of Technology Roorkee
E-mail: tapasfcy@iitr.ac.in

Employment & Research Experience

Assistant Professor (2011 onwards), Department of Chemistry, Indian Institute of Technology Roorkee, Roorkee, Uttarakhand

Assistant Professor (2010-2011), Department of Chemical Sciences, Sikkim University, Sikkim

Post Doctoral Research Associate (2008-2010), University of Glasgow, Glasgow, Scotland, UK

Post Doctoral Associate (2006-2008), Rutgers University, New Jersey, USA

Post Doctoral Researcher (2005-2006), University of New Orleans, Louisiana, USA

Ph. D. (2005), Indian Institute of Science, Bangalore

Research Interests

- Solid-state materials chemistry, nanomaterials chemistry, hydrogen energy
- Transition metal oxides, oxyhalides, pnictides, chalcogenides
- Superconductivity, half-metallic / metallic / semiconducting antiferro-/ferro-/ferri-magnetism (for spintronics), frustrated magnetism, multiferroics, photocatalysis and hydrogen storage
- Solid-state hydrogen storage in complex hydrides, graphene and nanostructured materials
- Novel synthetic strategies, structure-property correlation, synthetic control of structure and microstructure, advanced materials design

Publications:

36. Gollapally Naresh, Jaideep Malik, Vandana Meena and **Tapas Kumar Mandal**, pH-Mediated Collective and Selective Solar Photocatalysis by a series of Layered Aurivillius Perovskites, ***ACS Omega***, 3, 11104 (**2018**).

35. Kamalesh Pal, Kalyan Ghorai, Sudiksha Aggrawal, **Tapas Kumar Mandal**, Paritosh Mohanty, Md Motin Seikh and Arup Gayen, Remarkable Ti-promotion in vanadium doped anatase titania for methylene blue adsorption in aqueous medium, ***J. Env. Chem. Engg.***, 6, 5212 (**2018**).

34. Kamalesh Pal, Arka Dey, Partha P. Ray, Natalia E. Mordvinova, Oleg I. Lebedev, **Tapas K. Mandal**, Md Motin Seikh and Arup Gayen, Synthesis, Characterization and Catalytic Activity of Quadruple Perovskite: $CaCu_{3-x}Mn_xTi_{4-x}Mn_xO_{12}$ (x = 0, 0.5 and 1.0), ***Chemistry Select***, 3, 1076 (**2018**).

Dr. Tapas Kumar Mandal
Assistant Professor
Department of Chemistry
Indian Institute of Technology Roorkee
E-mail: tapasfcy@iitr.ac.in

33. Ambikeshwar Pandey, Gollapally Naresh and **Tapas Kumar Mandal**, Sunlight responsive new Sillén-Aurivillius A1X1 hybrid layered oxyhalides with enhanced photocatalytic activity, ***Solar Energy Materials & Solar Cells***, 161, 197 (**2017**). (**IF**: 4.784)

32. Seema Singh, Vimal Chandra Srivastava, Shang Lien Lo, **Tapas Kumar Mandal** and Gollapally Naresh, Morphology-controlled green approach for synthesizing the hierarchical self-assembled 3D porous ZnO superstructure with excellent catalytic activity, ***Microporous Mesoporous Mater.***, 239, 296 (**2017**). (**IF**: 3.615)

31. Seema Singh, Vimal Chandra Srivastava, **Tapas Kumar Mandal**, Indra Deo Mall and Shang Lien Lo, Synthesis and application of green mixed-metal oxide nanocomposites materials from solid waste for dye degradation, ***J. Environ. Mgmt.,*** 181, 146 (**2016**). (**IF**: 4.010)

30. Tinku Baidya, Parthasarathi Bera, Oliver Krocher, Olga Safonova, Paula M. Abdala, Birgit Gerke, Rainer Pöttgen, Kaustubh R. Priolkar and **Tapas Kumar Mandal**, Understanding the anomalous behavior of the Vegard's law in $Ce_{1-x}M_xO_2$ (M = Sn and Ti; $0 < x \leq 0.5$) solid solutions, ***Phys. Chem. Chem. Phys.***, 18, 13974 (**2016**). (**IF**: 4.123)

29. Rajib Mistri, Dipak Das, Jordi Llorca, Montserrat Dominguez, **Tapas Kumar Mandal**, Paritosh Mohanty, Bidhan Chandra Ray and Arup Gayen, Selective liquid phase benzyl alcohol oxidation over Cu-loaded $LaFeO_3$ perovskite, ***RSC Advances***, *6*, 4469 (**2016**). (**IF**: 3.108)

28. Gollapally Naresh and **Tapas Kumar Mandal**, Efficient COD Removal Coinciding with Dye Decoloration by Five Layer Aurivillius Perovskites under Sunlight Irradiation, ***ACS Sustainable Chem. Eng.***, 3, 2900 (**2015**). (**IF**: 5.951)

27. Seema Singh, Vimal Chandra Srivastava and **Tapas Kumar Mandal**, Treatment of Fertilizer Industry Wastewater by Catalytic Per-Oxidation Process using Copper loaded SBA-15, ***J. Environ. Sci. Health: Part A***, *50*, 1468, (**2015**). (**IF**: 1.425)

26. Shweta Garg, Vimal Chandra Srivastava, Seema Singh and **Tapas Kumar Mandal**, Catalytic Degradation of Pyrrole in Aqueous Solution by Cu/SBA-15, ***Int. J. Chem. React. Eng.***, *13*, 437 (**2015**). (**IF**: 0.623)

25. Gollapally Naresh and **Tapas Kumar Mandal**, Excellent Sun-Light-Driven Photocatalytic Activity by Aurivillius Layered Perovskites, $Bi_{5-x}La_xTi_3FeO_{15}$ (x = 1, 2), ***ACS Appl. Mater. Interfaces***, *6*, 21000, (**2014**). (**IF**: 7.504)

24. Seema Singh, Vimal Chandra Srivastava, **Tapas Kumar Mandal** and Indra Deo Mall, Synthesis of different crystalloraphic Al_2O_3 nanomaterials from solid waste for application in dye degradation, ***RSC Advances***, *4*, 50801, (**2014**). (**IF**: 3.108)

23. Rajiv Mistri, Sayantani maiti, Jordi Llorca, Montserrat Dominguez, **Tapas Kumar Mandal**, Paritosh Mohanty, Bidhan Chandra Ray and Arup Gayen, Copper ion substituted hercynite ($Cu_{0.03}Fe_{0.97}Al_2O_4$): A highly active catalyst for liquid phase oxidation of cyclohexane, ***Appl. Cat. A: General***, *485*, 40 (**2014**). (**IF**: 4.339)

Dr. Tapas Kumar Mandal
Assistant Professor
Department of Chemistry
Indian Institute of Technology Roorkee
E-mail: tapasfcy@iitr.ac.in

22. H. Reardon, J. Hanlon, R. W. Hughes, A. Godula-Jopek, **Tapas K. Mandal** and Duncan H. Gregory; Emerging concepts in solid-state hydrogen storage; The role of nanomaterials design, ***Energy and Environmental Science***, *5*, 5951 (**2012**). (**IF**: 29.518)

21. **Tapas K. Mandal** and Duncan H. Gregory; Hydrogen: Future energy vector for sustainable development, ***Proceedings of the Institution of Mechanical Engineers, Part C, Journal of Mechanical Engineering Science****, 224(C3)*, 539 (**2010**). (**IF**: 0.730)

20. **Tapas Kumar Mandal**, Mark Croft, Joke Hadermann, Gustaaf Van Tendeloo, Peter W. Stephens and Martha Greenblatt; La_2MnVO_6 Double Perovskite: A Structural, Magnetic and X-Ray Absorption Investigation, ***Journal of Materials Chemistry***, *19*, 4382 (**2009**). (**IF**: 8.262)

19. **Tapas K. Mandal** and Duncan H. Gregory; Hydrogen storage materials: present scenarios and future directions, ***Annual Reports Section A (Inorganic Chemistry)***, *105*, 21 (**2009**).

18. **Tapas Kumar Mandal**, Claudia Felser, Martha Greenblatt and Jürgen Kübler; Magnetic and electronic properties of double perovskites and estimation of their Curie temperatures by *ab initio* calculations, ***Physical Review B***, *78*, 134431 (**2008**). (**IF**: 3.718)

17. **Tapas Kumar Mandal**, Artem M. Abakumov, Maxim V. Lobanov, Mark Croft, Viktor V. Poltavets and Martha Greenblatt; Synthesis, Structure and Magnetic Properties of $SrLaMnSbO_6$: A New B-site Ordered Double Perovskite, ***Chemistry of Materials***, *20*, 4653 (**2008**). (**IF**: 9.407)

16. **Tapas Kumar Mandal**, Viktor V. Poltavets, Mark Croft and Martha Greenblatt; Synthesis, Structure and Magnetic Properties of $A_2MnB'O_6$ (A = Ca, Sr; B′ = Sb, Ta) Double Perovskites, ***Journal of Solid State Chemistry***, *181*, 2325 (**2008**). (**IF**: 2.265)

15. Viktor V. Poltavets, Konstantin A. Lokshin, Mark Croft, **Tapas K. Mandal**, Takeshi Egami and Martha Greenblatt; Crystal structure of T′-type $Ln_4Ni_3O_8$ (Ln = La, Nd) nickelates, ***Inorganic Chemistry***, *46*, 10887 (**2007**). (**IF**: 4.820)

14. **Tapas Kumar Mandal**, Artem M. Abakumov, Joke Hadermann, Gustaaf Van Tendeloo, Mark Croft and Martha Greenblatt; Synthesis, Crystal Structure and Magnetic Properties of $Sr_{1.31}Co_{0.63}Mn_{0.37}O_3$: A Derivative of the Incommensurate Composite Hexagonal Perovskite Structure, ***Chemistry of Materials***, *19*, 6158 (**2007**). (**IF**: 9.407)

13. Rohini Mani, P. Selvamani, Joby E. Joy, J. Gopalakrishnan and **Tapas Kumar Mandal**; A Study of $Ba_3M^{II}M^{IV}WO_9$ (M^{II} = Ca, Zn; M^{IV} = Ti, Zr) Perovskite Oxides: Competition between 3C and 6H Perovskite Structures, ***Inorganic Chemistry***, *46*, 6661 (**2007**). (**IF**: 4.820)

12. **Tapas Kumar Mandal** and J. Gopalakrishnan; New route to ordered double perovskites: Synthesis of rock salt oxides, Li_4MWO_6, and their transformation to Sr_2MWO_6 (M = Mg, Mn, Fe, Ni) via metathesis, ***Chemistry of Materials***, *17*, 2310 (**2005**). (**IF**: 9.407)

11. **T. K. Mandal**, T. Sivakumar, S. Augustine and J. Gopalakrishnan; Heterovalent cation-substituted Aurivillius phases, $Bi_2SrNaNb_2TaO_{12}$ and $Bi_2Sr_2Nb_{3x}M_xO_{12}$ (M = Zr, Hf, Fe, Zn), ***Materials Science & Engineering: B***, *121*, 112 (**2005**). (**IF**: 2.331)

Dr. Tapas Kumar Mandal
Assistant Professor
Department of Chemistry
Indian Institute of Technology Roorkee
E-mail: tapasfcy@iitr.ac.in

10. **Tapas Kumar Mandal**, Saji Augustine, J. Gopalakrishnan and Ph. Boullay; $Bi_4LnNb_3O_{15}$ and (Ln = La, Pr, Nd) and $Bi_4LaTa_3O_{15}$: New intergrowth Aurivillius related phases, ***Materials Research Bulletin***, *40*, 920 (**2005**). (**IF**: 2.435)

9. **Tapas Kumar Mandal**, L. Sebastian, J. Gopalakrishnan, L. Abrams and J. B. Goodenough; Hydrogen uptake by barium manganite at atmospheric pressure, ***Materials Research Bulletin***, *39*, 2257 (**2004**). (**IF**: 2.435)

8. Ramesh Sharma, **T. K. Mandal**, K. Ramesha and J. Gopalakrishnan; Synthesis and characterization of $AgBiO_3$ with the cubic $KSbO_3$ structure, ***Indian Journal of Chemistry***, *43A*, 11 (**2004**). (**IF**: 0.729)

7. Y. G. Zhao, R. Fan, X. P. Zhang, H. Balci, S. B. Ogale, T. Venkatesan, **T. K. Mandal** and J. Gopalakrishnan; Insulator-metal transition and magnetoresistance of oxygen deficient $La_{0.35}Ca_{0.65}MnO_y$, ***Journal of Magnetism & Magnetic Materials***, *284*, 35 (**2004**). (**IF**: 2.357)

6. **Tapas Kumar Mandal** and J. Gopalakrishnan; From rocksalt to perovskite: A metathesis route for the synthesis of perovskite oxides of current interest, ***Journal of Materials Chemistry***, *14*, 1273 (**2004**). (**IF**: 8.262)

5. Z. Serpil Gönen, **Tapas Kumar Mandal**, J. Gopalakrishnan, Bryan W. Eichhorn and Richard L. Greene; Novel ABO_3 oxides related to perovskite and $YAlO_3$ structure types in the La-B-V-O (B = Ni, Cu) systems, ***Indian Journal of Chemistry****, in* ***Special Issue on Modern Inorganic Chemistry***, *42A*, 2228 (**2003**). (**IF**: 0.729)

4. J. Gopalakrishnan, Z. Serpil Gönen, K. -S. Chang, Ichiro Takeuchi, **T. K. Mandal**, Bryan W. Eichhorn, James C. Fettinger and Richard L. Greene; Synthesis and structure of $La_{14}V_6CuO_{36.5}$: A transparent Cu(I) vanadate containing $[OCuO]^{3-}$ sticks, ***Journal of Materials Chemistry***, *12*, 3839 (**2002**). (**IF**: 8.262)

3. **Tapas Kumar Mandal**, N. Y. Vasanthacharya and J. Gopalakrishnan; A novel metathesis route for the synthesis of La_2CuO_4 and its superconducting analogues: Synthesis of a new lithium-substituted derivative of La_2CuO_4, ***Journal of Materials Chemistry***, *12*, 635 (**2002**). (**IF**: 8.262)

2. Y. G. Zhao, W. Cai, J. Zhao, X. P. Zhang, R. Fan, B. S. Cao, M. H. Zhu, Tom Wu, S. B. Ogale, S. R. Shinde, T. Venkatesan, Q. Y. Tu, **T. K. Mandal** and J. Gopalakrishnan; Insulator-metal transition and magnetic properties of $La_{0.5}Ca_{0.5}MnO_y$ induced by tuning the oxygen content, ***Journal of Applied Physics***, *92*, 5391 (**2002**). (**IF**: 2.101)

1. G. Zhao, W. Cai, J. Zhao, X. P. Zhang, B. S. Cao, M. H. Zhu, L. W. Zhang, S. B. Ogale, Tom Wu, T. Venkatesan, Li Lu, **T. K. Mandal** and J. Gopalakrishnan; Electrical transport and magnetic properties of $La_{0.5}Ca_{0.5}MnO_{3-y}$ with varying oxygen content, ***Physical Review B***, *65*, 144406 (**2002**). (**IF**: 3.718)

Dr. Tapas Kumar Mandal
Assistant Professor
Department of Chemistry
Indian Institute of Technology Roorkee
E-mail: tapasfcy@iitr.ac.in

Patents

1. Rapid Hydrothermal Synthesis of Hierarchically Mesoporous Li_3VO_4 and its Application as Anode Material in Lithium Ion Batteries, (Inventors: Nishnat Gautam, Paritosh Mohanty, Anjan Sil and **Tapas Kumar Mandal**), Indian Patent, Application No. **201711038135**; Filing Date 27.10.2017.

2. A Method of Synthesis of Lithium Vanadate on Graphene Oxide, (Inventors: Nishant Gautam and **Tapas Kumar Mandal**), Indian Patent, PPA No. **201811022066**; Filing Date 13.06.2018.

Books / Book-Chapters

1. **Tapas Kumar Mandal** and Martha Greenblatt; *Transition Metal Oxides: Magnetoresistance and Half-metallicity*, in Contemporary Inorganic Materials, (eds. D. W. Bruce, D. O'Hare and R. I. Walton), Volume 2: Functional Oxides, John Wiley & Sons, 2010.

Conference/Symposium/Meeting/Workshop

27. 23rd CRSI National Symposium in Chemistry, Indian Institute of Science Education & Research Bhopal, Bhopal, July 13-15 (**2018**). Vandana Meena and **Tapas Kumar Mandal**; Poster: *Topotactic Transformation of Non-Magnetic Layered Titanates into Magnetic Titanates through Soft-Chemistry*.

26. 23rd CRSI National Symposium in Chemistry, Indian Institute of Science Education & Research Bhopal, Bhopal, July 13-15 (**2018**). Jaideep Malik, Gollapally Naresh, Vandana Meena and **Tapas Kumar Mandal**; Poster: *Collective and Selective Solar Photocatalysis by $Bi_5ATi_4FeO_{18}$ (A = Ca, Sr and Pb) Aurivillius Perovskites*.

25. 2nd Shaping the Energy Future: Challenges and Opportunities (SEFCO-2018), Indian Institute of Petroleum, Dehradun, May 11-12 (**2018**). Sonia Rani and **Tapas Kumar Mandal**; Poster: *Transition Metal Incorporated New Sillén-Aurivillius A1X1 Layered Tungstates: Magnetism and Solar Photocatalysis.*

24. Multifunctional Materials: Analytical Techniques and Diverse Applications (MMAD18), NIT Kurukshetra, January 20 (**2018**). Expert talk: *New Oxides for Solar Photocatalysis and Energy Storage.*

23. Multifunctional Materials: Analytical Techniques and Diverse Applications (MMAD18), NIT Kurukshetra, January 20 (**2018**). Nishant Gautam, Prashanth Sandineni, Amitava Choudhury and **Tapas Kumar Mandal**; Poster: *A new synthetic route for $Na_3Fe(PO_4)_2$ layered phosphate: A potential cathode material for sodium and lithium ion batteries.*

22. Modern Trends in Inorganic Chemistry-XVII, National Chemical Laboratory (NCL) & Indian Institute of Science Education and Research (IISER), Pune, December 11-14 (**2017**). Jaideep Malik and **Tapas Kumar Mandal**; Poster: *Effect of Iron Substitution on Photocatalytic Activity of New Five Layered Aurivillius Perovskites.*

Dr. Tapas Kumar Mandal
Assistant Professor
Department of Chemistry
Indian Institute of Technology Roorkee
E-mail: tapasfcy@iitr.ac.in

21. Modern Trends in Inorganic Chemistry-XVII, National Chemical Laboratory (NCL) & Indian Institute of Science Education and Research (IISER), Pune, December 11-14 (**2017**). Vandana Meena and **Tapas Kumar Mandal**; Poster: *$Li_{1-x}Fe_xNbWO_6$: A Novel Layered Trirutile Oxide obtained by Topotactic Ion-Exchange and its Magnetic Properties.*

20. 21st CRSI National Symposium in Chemistry, Indian Institute of Chemical Technology, Hyderabad, July 14-16, (**2017**). Vijay Alwera and **Tapas Kumar Mandal**; Poster: *Manganese Oxides with various Morphologies: Applications in Catalytic Dye Removal*.

19. 21st CRSI National Symposium in Chemistry, Indian Institute of Chemical Technology, Hyderabad, July 14-16, (**2017**). Lalit Kumar and **Tapas Kumar Mandal**; Poster: *$A_3MTiSbO_9$ (A = Sr, Ba; M = Mn, Co): Composition Dependent New 3C and 6H Perovskite Phases and Their Magnetic Properties*.

18. 10th National Conference on Solid State Chemistry and Allied Areas (ISCAS-2017), Delhi Technological University, Delhi, July 1-3, (**2017**). Sonia Rani and **Tapas Kumar Mandal**; Oral Presentation: *Transition Metal Incorporated Two Layer Aurivillius Niobates: Magnetism and Solar Photocatalysis*.

17. Discussion Meeting on 'NMR Meets Materials', TCIS-TIFR, Hyderabad, May 5-6 (**2017**). Title of Talk: *Layered Titanates, Vanadates and Phosphates: Applications in Photocatalysis and Energy Storage*.

16. International Symposium on Solid State Chemistry, JNCASR, Bangalore, December 1-3 (**2016**).

15. 18th CRSI National Symposium in Chemistry, Punjab University & INST, Mohali February 5-7, (**2016**). Nishant Gautam, Hariraj, Anjan Sil and **Tapas Kumar Mandal**; Poster: *Novel Olivine type $LiMnPO_4$: Potential cathode materials for high voltage Li-ion battery.*

14. Modern Trends in Inorganic Chemistry-XVI, Jadavpur University, December 3-5 (**2015**). Gollapally Naresh and **Tapas Kumar Mandal**; Poster: *Sunlight-driven Selective Dye Degradation over New Sillen-Aurivillius Layered Perovskites.*

13. International Conference on Emerging Materials and Applications (ICEMA'14), IIT Roorkee, Saharanpur Campus, April 5-6 (**2014**). Kamini Gupta, Gollapally Naresh and **Tapas Kumar Mandal**; Poster: *Novel perovskites in the Pb-La-Ti-Fe-O system: Synthesis, characterization and visible-light photocatalysis.*

12. Modern Trends in Inorganic Chemistry-XV, IIT Roorkee, December 13-16 (**2013**). Gollapally Naresh and **Tapas Kumar Mandal**; Poster: *Novel transition metal incorporated Aurivillius phases $Bi_{5-x}La_xTi_3FeO_{15}$ (x = 0 - 2) as visible light photocatalysts.*

11. National Magnetic Resonance Society Symposium 2013 (NMRS 2013), IIT Bombay, February 3-6 (**2013**). Nishant Gautam, **Tapas Kumar Mandal**, Elumalai Viswanathan and Subramanian Ganapathy; Title of talk: *Synthesis, characterization and solid state NMR studies of two and three-dimensional lithium lanthanum/calcium titanates*

10. 49th Annual Convention of Chemists 2012 (organized by Indian Chemical Society), Dept. of Applied Sciences, NITTTR, Bhopal, December 12-15 (**2012**). Rajiv Mistri, Sayantani Maiti, Jordi Llorca, **Tapas Kumar Mandal**, Bidhan Chandra Ray and Arup Gayen; Poster: *Selective oxidation of cyclohexane with hydrogen peroxide in presence of copper ion substituted spinel oxide substituted catalysts* $Cu_xM_{1-x}Al_2O_4$ *(x =0-0.07; M = Mg, Mn, Fe, Ni, Zn)*.

9. Modern Trends in Inorganic Chemistry-XIV, University of Hyderabad, December 10-13 (**2011**). **Tapas Kumar Mandal**, Mark Croft and Martha Greenblatt; Poster: *Double Perovskites as Exotic Magnetic Materials: Synthesis of* La_2MnVO_6 *and Future Challenges.*

8. Scottish Hydrogen and Fuel Cell Association Membership Meeting, University of St. Andrews, St. Andrews, UK, February 17 (**2010**). **Tapas Kumar Mandal**; Title of talk: *Solid-state hydrogen storage: the state of the art and potential solutions*.

7. ISIS Crystallography User Group Meeting, Abingdon, UK, November 5-6 (**2009**). **Tapas K. Mandal** and Duncan H. Gregory; Poster: *Hydrogen storage in the 1:1* $LiNH_2$-MgH_2 *system: An X-ray diffraction investigation*.

6. 42nd IUPAC World Chemistry Congress, SECC, Glasgow, UK, August 2-7 (**2009**).

5. Universities of Scotland Inorganic Conference (USIC), University of Strathclyde, Glasgow, UK, September 11-12 (**2008**).

4. 22nd Annual Symposium of the Laboratory for Surface Modification, Rutgers University, Piscataway, New Jersey, USA, February 15 (**2008**). **Tapas K. Mandal**, Viktor V. Poltavets, Mark Croft and Martha Greenblatt; Poster: *Synthesis and manipulation of low-dimensional transition metal oxides towards realization of novel electronic properties.*

3. Materials Research Society Symposium Proceedings Series, Volume 988E, November 28-30 (**2006**). Elisha Josepha, **Tapas Mandal** and John B. Wiley; Poster QQ9.19: *The Synthesis and Characterization of* $CsAeBiO_2Cl_2$ *(Ae = Ca, Sr, Ba).*

2. *SSCU Silver Jubilee International Symposium on Solid State and Materials Chemistry*, Indian Institute of Science, Bangalore, India, December 4–7 (**2001**).

1. *Winter School in Solid State and Materials Chemistry*, Jawaharlal Nehru Center for Advanced Scientific Research, Bangalore, India, 29 November 29 – December 4 (**1999**).