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Professional Experience

December 2019 –to– Ongoing	**DST INSPIRE Faculty** at International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Balapur, Hyderabad.
October 2018 –to– November 2019	**DST INSPIRE Faculty** at Centre for Advanced Studies (CAS), A. P. J. Abdul Kalam Technical University (AKTU), Lucknow.
March 2017 –to– September 2018	**Postdoctoral Researcher** at Institute for Basic Science (IBS), Center for Integrated Nanostructure Physics (CINAP), Sungkyunkwan University (SKKU), South Korea.

Education

July 2012 –to– December 2016	**Doctor of Philosophy (Ph.D.) in Chemistry**, Indian Institute of Technology, Kharagpur, India. **Thesis title**: *Synthesis of Transition Metal Oxo-/Hydroxo-Nanomaterials for Environmental Remediation and Energy Storage Application.*
July 2009 –to– June 2011	**Master of Science (M.Sc)** in Chemistry, West Bengal State University, Barasat, India. Specialization – *Inorganic chemistry*
July 2006 –to– June 2009	**Bachelor of Science (B.Sc.)** in Chemistry, University of Calcutta, Kolkata, India

Research Experiences

Current research area (at ARCI, Hyderabad):

- Development of efficient cathode material for Na-ion battery.
- Large scale synthesis of battery-grade hard carbon and its composite for Na-ion battery anode.
- Fabrication and optimization of full cell Li/Na-ion battery & capacitor.
- Device-level fabrication of supercapacitor and metal-ion battery in a semi-automatic pilot plant.
- Hands-on experience on the development of cylindrical supercapacitor (1200 F, 2.7 V).

Previous research area:

- Development of different transition oxides/hydroxides (TMOs/TMHs) nanomaterials for the application in high-performance Li-ion capacitor/battery, aqueous asymmetric supercapacitor.

- Synthesis and optimization of different transition metal oxides/hydroxides (TMOs/TMHs) for multidimensional applications, such as, photocatalysis, adsorption study, sensing, catalysis *etc.*

Awards and Achievements

- Selected for **INSPIRE Faculty Award**-2018 (Session-I) under the AORC Scheme of DST.
- Selected for the **SERB Indo-U.S. Postdoctoral Fellowship**, Science and Engineering Research Board (SERB) and Indo-U.S. Science and Technology Forum (IUSSTF) at **University of Texas, Texas**, August 2017-*denied the offer*.
- **CSIR-NET**, Govt. of India (All India Rank-60), December 2011.
- **GATE**, Govt. of India (All India Rank -180), February 2012.

R & D Project

Title	Amount (years)	Funding agency
Transition metal dichalcogenides (TMDs) nanostructure; a better alternative for Li-ion and Na-ion battery anode	35 Lakhs (5 years)	DST, Govt. of India

Publications

Journals:

1. **Sahoo, R.**; Sing, M.; Rao, T. N. A Review on the Current Progress and Challenges of 2D layered Transition Metal Dichalcogenides (TMDs) as Li/Na-ion Battery Anode. ChemElectroChem **2021**, doi.org/10.1002/celc.202100197. (Corresponding author). **(I. F.- 4.154)**
2. Mane R. B.; **Sahoo, R.;** Reddy, B. K. S.; Vijay, R.; Panigrahi, B. B.; Borse, P. H.; Chakravarty, D.; Doping-induced coloration in titania. *J. Am. Ceram. Soc.* **2021**, doi. org/10.1111/jace.17790. **(I. F.- 3.09)**
3. Luu T. H.; Duong, D. L.; Lee T. H.; Pham, D. T.; **Sahoo, R.;** Han, G.; Kim, Y. M. and Lee, Y. H. Monodispersed SnS Nanoparticles Anchored on Carbon Nanotubes for High-Retention Sodium-Ion Batteries. *J. Mater. Chem. A* **2020**, *8*, 7861-7869. **(I. F.- 11.3)**
4. **Sahoo, R.;** Lee T. H.; Pham, D. T.; Luu T. H. and Lee, Y. H. Fast-Charging High-Energy Battery–Supercapacitor Hybrid: Anodic Reduced Graphene Oxide–Vanadium(IV) Oxide Sheet-on-Sheet Heterostructure. *ACS Nano* **2019**, *13*, 10776-10786. **(I. F.- 14.58)**
5. **Sahoo, R.;** Pham, D. T.; Lee T. H.; Seok J.; Luu T. H. and Lee, Y. H. Redox-Driven Route for Widening Voltage Window in Asymmetric Supercapacitor. *ACS Nano* **2018**, *12*, 8494-8505. **(I. F.- 14.58)**
6. Lee T. H.; Pham, D. T.; **Sahoo, R.;** Seok J.; Luu T. H. and Lee, Y. H. High Energy Density and Enhanced Stability of Asymmetric Supercapacitors with Mesoporous MnO_2@CNT and Nanodot MoO_3@CNT Free-Standing Films. *Energy Storage Mater.* **2018**, *12*, 223-231. (**I. F. - 15.97**)
7. **Sahoo, R.;** Acharyya, P.; Sing, N. K.; Pal, A.; Negishi, Y. and Pal, T. Advance Aqueous Asymmetric Supercapacitor Based on Large 2D $NiCo_2O_4$ Nanostructures and the rGO@Fe_3O_4 Composite. *ACS Omega* **2017**, *2*, 6576−6585. **(I. F.- 2.584)**
8. Roy, A.; **Sahoo, R.;** Chowdhury, J.; Bhattacharya, T. S.; Agarwal, R. and Pal, T. Directional Growth of Ag Nanorod from Polymeric Silver Cyanide: A Potential Substrate for Concentration Dependent SERS Signal Enhancement Leading to Melamine Detection. *Spectrochim. Acta Mol. Biomol. Spectrosc.* **2017**, 183, 402-407. **(I. F.- 2.098)**
9. Aditya, T.; Jana, J.; **Sahoo, R.;** Roy, A.; Pal, A. and Pal, T. Silver Molybdates with Intriguing Morphology and Peroxidase Mimic with High Sulfide Sensing Capacity. *Cryst. Growth Des.* **2017**, *17*, 295-307. **(I. F.- 4.153)**

10. Roy, A.; Debnath, B.; **Sahoo, R.;** Pal, T. Micelle Confined Mechanistic Pathway for 4-Nitrophenol Reduction. *J. Colloid. Interface Sci.* **2017**, *493*, 288-294. **(I. F.- 5.091)**

11. **Sahoo, R.;** Pal, A. and Pal, T. Proportion of Composition in a Composite does Matter to Behave as an Advanced Supercapacitor. *J. Mater. Chem. A* **2016**, 4, 17440-17454. **(I. F.- 10.733)**

12. **Sahoo, R.;** Pal, A. and Pal, T. 2D Materials for Renewable Energy Storage Devices: Outlook and Challenges. *Chem. Commun.* **2016**, *52*, 13528-13542. **(I. F.- 6.290)**

13. **Sahoo, R.;** Sasmal, A. K.; Ray, C.; Dutta, S.; Pal, A. and Pal, T. Suitable Morphology Makes $CoSn(OH)_6$ Nanostructure a Superior Electrochemical Pseudocapacitor. *ACS Appl. Mater. Interfaces* **2016**, *8*, 17987-17998. **(I. F.- 8.456)**

14. **Sahoo, R.;** Santra, S.; Ray, C.; Pal, A.; Negishi, Y.; Ray, S. K. and Pal, T. Hierarchical Growth of $ZnFe_2O_4$ for Sensing Applications. *New J. Chem.* **2016**, *40*, 1861-1871. **(I. F.- 3.201)**

15. Roy, A.; **Sahoo, R.;** Ray, C.; Dutta, D. and Pal, T. Soft Template Induced Phase Selective Synthesis of Fe_2O_3 Nanomagnets: One Step towards Peroxidase-mimic Activity Allowing Colorimetric Sensing of Thioglycolic Acid. *RSC. Adv.* **2016**, *6*, 32308-32318. **(I. F.- 2.936)**

16. Sasmal, A. K.; Pal, J.; **Sahoo, R.;** Kartikeya, P.; Dutta, S. and Pal, T. Superb Dye Adsorption and Dye-Sensitized Change in Cu_2O−Ag Crystal Faces in the Dark. *J. Phys. Chem. C* **2016**, *120*, 21580-21588. **(I. F.- 4.309).**

17. Roy, A.; Debnath, B.; **Sahoo, R.;** Chandrakumar, K. S.; Ray, C.; Jana, J. and Pal, T. Enhanced Catalytic Activity of Ag/Rh Bimetallic Nanomaterial: Evidence of an Ensemble Effect. *J. Phys. Chem. C* **2016**, *120*, 5457-5467. **(I. F.- 4.309)**

18. Ray, C.; Dutta, S.; **Sahoo, R.;** Roy, A.; Negishi, Y. and Pal, T. Fabrication of Nitrogen-Doped Mesoporous-Carbon-Coated Palladium Nanoparticles: An Intriguing Electrocatalyst for Methanol and Formic Acid Oxidation. *Chem. Asian J.* **2016**, *11*, 1588-1596. **(I. F.- 3.692)**

19. Dutta, S.; Ray, C.; Roy, A.; **Sahoo, R.** and Pal, T. Metal Bromide Controlled Interfacial Aromatization Reaction for Shape-Selective Synthesis of Palladium Nanostructures with Efficient Catalytic Performances. *Chem. Eur. J.* **2016**, *22*, 10017-10027. **(I. F.- 5.16)**

20. Ray, C.; Dutta, S.; Roy, A.; **Sahoo, R.** and Pal, T. Redox Mediated Synthesis of Hierarchical Bi_2O_3/MnO_2 Nanoflowers: a Non-Enzymatic Hydrogen Peroxide Electrochemical Sensor. *Dalton trans.* **2016**, *45*, 4780-4790. **(I. F.- 4.099)**

21. **Sahoo, R.;** Roy, A.; Dutta, S.; Ray, C.; Aditya, T.; Pal, A. and Pal, T. Liquor Ammonia Mediated V(V) Insertion in Thin Co_3O_4 Sheets for Improved Pseudocapacitors with High Energy Density and High Specific Capacitance Value. *Chem. Commun.* **2015**, 51, 15986-15989. **(I. F.- 6.290)**

22. **Sahoo, R.;** Pradhan, M.; Roy, A.; Dutta, S.; Ray, C.; Negishi, Y.; Pal, A and Pal, T. Redox-Mediated Synthesis of a Fe_3O_4–MnO_2 Nanocomposite for Dye Adsorption and Pseudocapacitance. *Chem. Asian J.* **2015**, *10*, 1571-1580. **(I. F.- 3.692)**

23. Dutta, S.; **Sahoo, R.**; Ray, C.; Sarkar, S.; Jana, J.; Negishi, Y. and Pal, T. Biomolecule-Mediated CdS-TiO_2-Reduced Graphene Oxide Ternary Nanocomposites for Efficient Visible Light-Driven Photocatalysis. *Dalton trans.* **2015**, *44*, 193-201. **(I. F.- 4.099)**

24. Mondal, C.; Singh, A.; **Sahoo, R.;** Sasmal, A. K.; Negishi, Y. and Pal, T. Preformed ZnS Nanoflower Prompted Evolution of CuS/ZnS p–n Heterojunctions for Exceptional Visible-Light Driven Photocatalytic Activity. *New J. Chem.* **2015**, *39*, 5628-5635. **(I. F.- 3.201)**

25. Pradhan, M.; Roy, A.; Sinha, A. K.; **Sahoo, R.;** Deb, D. and Pal, T. Solid-state Transformation of Single Precursor Vanadium Complex Nanostructures to V_2O_5 and VO_2: Catalytic Activity of V_2O_5 for Oxidative Coupling of 2-Naphthol. *Dalton trans.* **2015**, *44*, 1889-1899. **(I. F.- 4.099)**

26. Dutta, S.; Ray, C.; Sarkar, S.; Roy, A., **Sahoo, R.** and Pal, T. Facile Synthesis of Bimetallic Au-Pt, Pd-Pt, and Au-Pd Nanostructures: Enhanced Catalytic Performance of Pd-Pt Analogue towards Fuel Cell Application and Electrochemical Sensing. *Electrochimica Acta* **2015**, *180*, 1075-1084. **(I. F.- 5.116)**

27. Ray, C., Sarkar, S.; Dutta, S.; Roy, A.; **Sahoo, R.;** Negishi, Y. and Pal, T. Evolution of Tubular Copper Sulfide Nanostructures from Copper(I)–Metal Organic Precursor: a Superior Platform for the Removal of Hg(II) and Pb(II) Ions. *RSC Adv.* **2015**, *5*, 12446-12453. **(I. F.- 2.936)**

28. Dutta, S.; Ray, C.; Mallick, S.; Sarkar, S.; **Sahoo, R.;** Negishi, Y. and Pal, T. A Gel-Based Approach To Design Hierarchical CuS Decorated Reduced Graphene Oxide Nanosheets for Enhanced Peroxidase-like Activity Leading to Colorimetric Detection of Dopamine. *J. Phys. Chem. C* **2015**, *119*, 23790-23800. **(I. F.- 4.484)**

29. **Sahoo, R;** Dutta, S.; Pradhan, M.; Ray, C.; Roy, A. Pal, T and Pal. A. Arsenate Stabilized Cu_2O Nanoparticle Catalyst for One-Electron Transfer Reversible Reaction. *Dalton trans.* **2014**, *43*, 6677-6683. **(I. F.- 4.099)**

30. **Sahoo, R.;** Roy, A.; Ray, C.; Mondal, C.; Negishi, Y.; Yusuf, S. M.; Pal, A. and Pal, T. Decoration of Fe_3O_4 Base Material with Pd Loaded CdS Nanoparticle for Superior Photocatalytic Efficiency. *J. Phys. Chem. C* **2014**, *118*, 11485-11494. **(I. F.- 4.309)**

31. Roy, A.; Pradhan, M.; Ray, C.; **Sahoo, R.;** Dutta, S. and Pal, T. Facile Synthesis of Pyridine Intercalated Ultra-long V_2O_5 Nanowire from Commercial V_2O_5: Catalytic Applications in Selective Dye Degradation. *CrystEngComm* **2014**, *16*, 7738-7744. **(I. F.- 3.304)**

32. Pal, A.; Saha, S.; Maji, S. K.; **Sahoo, R.;** Kundu, M. and Kundu, A. Galvanic Replacement of As(0) Nanoparticles by Au(III) for Nanogold Fabrication and SERS Application. *New J. Chem.* **2014**, *38*, 1675-1683. **(I. F.- 3.277)**

33. Ray, C.; Dutta, S.; Sarkar, S.; **Sahoo, R.;** Roy, A. and Pal, T. Intrinsic Peroxidase-like Activity of Mesoporous Nickel Oxide for Selective Cysteine Sensing. *J. Mater. Chem. B* **2014**, 2, 6097-6105. **(I. F.- 4.476)**

34. Dutta, S.; Sarkar, S.; Ray, C.; Roy, A. **Sahoo, R.** Pal, T. Mesoporous Gold and Palladium Nanoleaves from Liquid–Liquid Interface: Enhanced Catalytic Activity of the Palladium Analogue toward Hydrazine-Assisted Room-Temperature 4-Nitrophenol Reduction. *ACS appl. Mater.& interfaces* **2014**, 6, 9134-9143. **(I. F.- 8.097)**

35. Mondal, C.; Ganguly, M.; Pal, J.; **Sahoo, R.;** Sinha, A. K. and Pal, T. Pure Inorganic Gel: a New Host with Tremendous Sorption Capability. *Chem. Commun*. **2013**, *49*, 9428-9430. **(I. F.- 6.164)**

36. Ray, C., Dutta, S.; Sarkar, S.; **Sahoo, R.;** Roy, A. and Pal, T. A Facile Synthesis of 1D Nano Structured Selenium and Au Decorated Nano Selenium: Catalysts for the Clock Reaction. *RSC Adv.* **2013**, *3*, 24313-24320. **(I. F.- 2.936)**

37. Mondal, C.; Ganguly, M.; Sinha, A.K.; Pal, J.; **Sahoo, R.** and Pal, T. Robust Cubooctahedron $Zn_3V_2O_8$ in Gram Quantity: a Material for Photocatalytic Dye Degradation in Water. *CrystEngComm* 2013, 15, 6745-6751. **(I. F.- 3.304)**

Book Chapter:

- **Sahoo, R.;** Pal, A. and Pal, T. (2018) Noble Metal-Transition Metal Oxides/Hydroxides: Desired Materials for Pseudocapacitor. In Noble Metal-Metal Oxide Hybrid Nanoparticles: Fundamentals and Applications. ELSEVIER, **2019**, 395-430 (ISBN: 978-0-12-814135-9).

Citation Metrics (based on Google Scholar)

Total Citation – 1251
h-index – 21
i10 – index – 31

Research Skills

- Synthesis of nanomaterials with several unique morphologies using hydrothermal techniques, microwave techniques, ball-milling, CVD, etc.
- Analysis of different physical methods: FESEM, EDX, TEM, HRTEM, SAED, STEM, AFM, powder XRD, XPS, FTIR, UV-vis spectra, fluorescence spectra, DRS, FTIR spectra, BET, TGA.
- Work experience with the instruments such as electrochemical workstation (CHI 660E, Bio-logic VMP3, Arbin BT2000, PARSTAT potentiostat), FESEM (FEI NOVA NANOSEM 450), Powder XRD (SmartLab), BET, Fluorometer (Thermo Fisher), Spectrophotometer (Thermo Fisher), Raman *etc.*
- Hands-on experience in a semi-automatic pilot plant to develop supercapacitor and metal-ion battery device.

Academic Actives

- Supervised one postgraduate trainee (PGTP) and one post-graduation project thesis (M.Tech.) at ARCI, Hyderabad (2020-2021).
- Trained one Project assistant for one year at Centre for Advanced Studies, AKTU (2018-2019).
- Mentored three M.Tech. Students, Centre for Advanced Studies, AKTU for their minor project thesis (2019-2020).
- Mentored one Ph.D. student, Sungkyunkwan University, South Korea for one year (2017-2019).
- Mentored two M.Sc. students for their dissertation work at IIT Kharagpur for one year (2015-2016).

Teaching Actives

1. **DST Inspire Faculty,** at Centre for Advanced Studies (1 year and 2 months)

Course	Course Code
Core Course	
• Introduction to Nanotechnology	NST 103
• Overview of Advanced Micro & Nano-material Characterization Techniques	NST 201
• Applied Chemistry: Bio and Materials Chemistry	
• Energy Conversion and Storage System	NST102
Elective Course	EST 103
• Nanotechnology for Environmental Applications	NSTE2 206

2. **Guest Lecturer**, Ananda Mohan College, Kolkata for UG teaching (from September 2011 to April 2012).
3. Teaching Assistant, IIT Kharagpur (from July, 2012-May-2015)

Membership

ECS: Member (ID: 423133)

Volunteer Service

As a peer reviewer:

- ✓ **Carbon (ELSEVIER)**
- ✓ **Energy Storage Materials (ELSEVIER)**

- ✓ **Catalysis Today (ELSEVIER)**
- ✓ **Applied Surface Science (ELSEVIER)**
- ✓ **ChemElectroChem (Wiely)**

Presentations

1. Oral presentation (nominated by Director, ARCI) on "Electrochemical Behavior of Mixed Valance Vanadium Oxide as Potential Negative Electrode", Young Scientist' Conference (YSC), IISF, 22-25 December 2020.

2. Poster Presentation on 'Redox Guided Synthesis of Fe_3O_4-MnO_2 Composite as Electrochemical Pseudocapacitor', RTFMNN, Kolkata, India, February 04-05, 2016.

3. Oral Presentation on 'Fabrication of Cobalt Oxide Based Pseudocapacitor with High Energy Density and High Specific Capacitance Value', NANO-15, Tiruchigide, India, December 07-10, 2015.

4. Poster Presentation on 'Submerged Iron Nanoparticle for Evolution of Fe_3O_4 Based Photoactive and Adsorbent Materials', NANODAYS 2015, Kolkata, February 16-18, 2015.

5. Attend 'ACS on Campus event' at IIT Kharagpur, India, November 2013.

6. Attend 'Modern trend of Chemistry in the 21st Century', Kolkata, India, February 06-07, 2012.

Personal details

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Permanent address	S/O- Basudeb Sahoo, Vill- Krishnapur, P.O. + P.S.- Belda, Dist- Paschim Medinipur, West Bengal, 721424, India