Dr. KOTHANDARAMAN Ramanujam

Annamalai & Santi Rajendran Chair Professor

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Career Summary: Materials electrochemist focusing on redox chemistries for flow batteries, alkali-metal ion batteries, and electrochemical N_2/CO_2 reduction. Since 2011, secured over $5.8M USD in external research and consulting support, published ~180 journal articles, and filed 19+ patents. In parallel, I have built strong international networks across academia, industry, and government (India, Australia, South Africa, South Korea, Taiwan, USA), translating lab research into deployed technologies (kW-scale flow batteries with ONGC, Archean Chemicals, High Energy Batteries) and strengthening the electrochemistry community via society leadership, student chapter mentoring, and international conferences. I have mentored 40 graduate (PhD) students (24 graduated, 20 on roll) and many M.Sc students.

Professional Appointments:

July 2021– current: Professor, Dept. Chemistry, IIT Madras, Chennai, India
June 2016 – June 2021: Associate Professor, Dept. Chemistry, IIT Madras, Chennai, India
March 2011 – June 2016: Assistant Professor, IIT Madras, Chennai, India
March 2009 – Feb 2011: Research Associate, National Research Council of Canada, Ottawa (Supervisor: Dr Christina Bock)
March 2007 – Feb 2009: Post Doctoral Researcher, Dept. Chemical Engineering, Michigan State University, East Lansing, USA (Supervisor: Prof Scott Calabrese Barton)

Leadership, Networks & Community Building:

Founding Chairman, Society of Materials Chemistry –Chennai Chapter (BARC, Mumbai, 2025–Current) (more at smcchennaichapter.com)
– Established a new regional platform connecting academic, industrial, and national lab communities in materials chemistry through symposia and thematic meetings.
Vice President, Society for Advancement of Electrochemical Science and Technology (SAEST, 2023–24)
– Supported national-level initiatives in electrochemical science, including technical meetings and outreach to young researchers.
Vice President, Indian Society for Electroanalytical Chemistry (ISEAC, 2021–24)
– Contributed to strengthening India's electroanalytical chemistry community through conferences and collaborative programs.
Executive Council Member, Electrochemical Society of India (ECSI, 2024–Current)
– Engaged in strategic planning for national electrochemical research and training activities.
Faculty Advisor & Initiator, Electrochemical Society – IIT Madras Student Chapter (since 2022)
– Mentored a highly active student chapter that received the ECS "Chapters of Excellence" / best student group award in 2023, increasing student engagement with global ECS activities. (more at Ecsiitm.com)

International and National Academic Appointments:

May 2025- May 2028 Adjunct Faculty, Centre for Future Materials, **University of Southern Queensland**, Australia (Developing joint research and student exchange activities in sustainable energy storage)

April 2019 – June 2018: Visiting Faculty, Energy, Environment & Chemical Engineering **Department Washington University, St. Louis, USA** (Collaborated on energy and environmental engineering projects, strengthening IITM–WashU ties)

March 2023 – March 2024: Adjunct Faculty, Atria University, Bangalore, India (Supported curriculum and research activities in energy materials)

Education:

June 2006: PhD, Indian Institute of Science Bangalore (Thesis: Studies on Direct Methanol and Direct Borohydride Fuel Cells), Supervisor: Prof. Ashok Kumar Shukla

May 2002: MSc in Applied Chemistry, Anna University, Chennai

May 1998: BSc in Chemistry, Bharathiyar University, Coimbatore

Awards and Honours:

Name of the Award	From
ASC-Masila Vijaya Award -2024 (for innovative patent)	The Academy of Sciences, Chennai
IESA Researcher of the year-2024	India Energy Storage Alliance (IESA)
SMC Bronze Medal – 2023	Society of Materials Chemistry, BARC, India
CRSI Bronze Medal – 2023	Chemical Research Society of India
Australia Awards Fellowships to collaborate with U. Sydney	Department of Foreign Affairs and Trade
Trend Setter Grant Award-2023 (Rs 49 lakhs = $58k)	The Energy Consortium, IIT Madras
CSR Changemaker Award-2023	IIT Madras
Amara Raja Award-2021	Electrochemical Society of India, Bengaluru
Fellow of the Royal Society of Chemistry (2020)	RSC
Fellow of the Academy of Sciences, Chennai	Academy of Sciences, Chennai
Gold Medallist in BSc, University 1st Rank holder	Bharathiar University, Coimbatore

Editorial Service & Community Coordination: Coordinated international teams of authors and reviewers, strengthening global networks in electrochemistry and energy storage

- **Guest Editor** – Springer | *Ionics*, for the special issue to celebrate the contributions of Prof A K Shukla (ECS Fellow) to the field of applied electrochemistry (2025) https://link.springer.com/article/10.1007/s11581-025-06418-7
- **Guest Editor** – Wiley | *Asian J. Organic Chemistry, ChemNanoMat & Chemistry An Asian Journal*, for the special collection honoring Prof. Indrapal Singh Aidhen for his contributions to Carbohydrate and Materials Chemistry (2026)
- **Guest Editor**- Publisher | *J. Electrochemical Society of India* for the special issue on Flow Batteries (2025)

- **Guest Editor** – Wiley | *Small, Batteries & Supercaps, Advanced Sustainable Systems* for the special collection of articles from the International Conference on Energy Conversion & Storage – 2025
- **Guest editor** – Publisher | *J. Electrochem. Soc.*, the USA for the focus issue on Energy Storage in China 2021
- **Guest editor** - Publisher | the special issue (2022) on "Energy Storage and Photovoltaics" from *J. Photochemistry and Photobiology*

International Collaborations and MoU:

- Visited **MCUT Taiwan** sponsored by MCUT between 26th Feb – 1st March 2025 & 14 - 18th October 2025 as invited speaker for SDSE-2025 conference and to sign MoU for joint degree program
- Visited the **University of Pretoria** sponsored by Uni. Pretoria for conducting a workshop on "Renewable Energy and Storage" between 1st to 3rd October 2025 and to sign MoU.
- Visited **DGIST, South Korea** funded through a joint project between DGIST-IITM, and delivered a invite talk at Polymer Society of Korea's conference at Jeju between 11th April to 20th April 2025 with DGIST support.
- Visited **U. Sydney** with Joint Funding from Bilateral Mobility Program (6th – 12th September 2023 for initiating research collaboration between IITM and U. Sydney)
- Visited **U. Sydney** along with a delegation of IITM between 12th – 26th November 2023 using Australia Award Fellowship of Department of Foreign Affairs and Trade (DFAT)-Australia.
- Visited **U. Sydney** under the International SDG Collaboration Program 2024 awarded by the Office of Global & Research Engagement of U. Sydney (20th June – 1st July 2024)

International Conferences Conducted:

IECS-2023, IECS-2025, **Small Science Symposium-2025**, ICSTEE-2025

Industry & Societal Impact Network:

- 5kWh Zn-Br_2 flow battery with proprietary additives to Archean Chemicals Pvt. Ltd. Technology transferred to Archean *https://twitter.com/iitmadras/status/1631195298872840192?t=S36XIIWYi5nddJsp7n3AKw&s=08*
- Development of 10kW/100kWh Vanadium Redox Flow battery to Oil and Natural Gas Corporation (ONGC-OECT), India.
- Demonstrated kW-scale flow battery in the Indi Energy Week held in Goa in February 2024.
- Served in the technical committee of Bureau of Indian Standards (BIS) for framing standards on battery testing and life prediction.

NPTEL Experience:

- Developed and successfully run online National Programme on Technology Enhanced Learning (NPTEL+) courses (eMobility and Battery Technology) for Industry

professionals and freelancers. The eMobility course is running its 8th Cohort and Battery Technology is its 3rd Cohort successfully. ID5500 Battery Technology course will be available from July 2026 (recording completed with NPTEL), and CY6015 Electrochemistry for Web-Enabled MTech will be ready by Jan 2026 (recording underway).

- https://elearn.nptel.ac.in/shop/exec-edu-ongoing/certificate-programme-on-emobility-cpoem-cohort-8/?v=13b5bfe96f3e
- https://elearn.nptel.ac.in/shop/completed-courses/execedu-closed/battery-cell-technology-cohort-3/?v=13b5bfe96f3e

Publication summary/selected papers/patents

>180 articles, (most of them as corresponding authors), h-index: 33, i10: 112; Citations: 4420, Patents: 11 granted & 8 pending
https://scholar.google.com/citations?user=8MvVXi8AAAAJ&hl=en
https://orcid.org/0000-0003-2231-2665

Peer-Reviewed Publications: Primary Research

180. Anoop Naikkath, Kothandaraman Ramanujam, Ramanathan Srinivasan, A regenerable tin gas diffusion electrode as a durable and cost-effective cathode for large-scale CO_2 reduction with enhanced viability via brine co-electrolysis, *Electrochimica Acta*, 549, **2026**,148018, https://doi.org/10.1016/j.electacta.2025.148018

179. Monika Senthilkumar, Vikram Venkatesan, Swati Panigrahi, Kothandaraman Ramanujam, Anandhakumar Sukeri, Gold Nanoparticles Decorated Borophene Nanosheets: An Efficient Catalyst for Ultrafast Chemical Dye Degradation of Methylene Blue and Rhodamine B, *ChemCatChem*, 7,23**, 2025,** e01286, https://doi.org/10.1002/cctc.202501286

178. Swati Panigrahi, Wataru Ueda, Ken Watanabe, Kothandaraman Ramanujam , Bi–Al co-doping in garnet electrolytes: Toward scalable, high-density, and cost-effective solid-state electrolytes, *Journal of Alloys and Compounds,* **2025**, 1041,183796, https://doi.org/10.1016/j.jallcom.2025.183796

177. Swati Panigrahi, Anandhakumar Sukeri, and Kothandaraman Ramanujam Borophene anchored gold nanoparticles; an efficient two-dimensional catalyst for the conversion of 4-nitrophenol to 4-aminophenol, *Applied Materials Today*, **2025**, 47, 102934, https://doi.org/10.1016/j.apmt.2025.102934

176. Karthikraja Esackraj, Venkata Surya Kumar Choutipalli, Naga Venkateswara Rao Nulakani, Kothandaraman Ramanujam, Ganesan Vaidyanathan, Shuford Vaidyanathan, Subramanian Kevin, Venkatesan, Rational Design of BN-Based Biphenylene Analogues as Single-Atom Catalysts for Electrochemical Nitrogen Reduction Reaction, *ACS Applied Energy Materials*, **2025**, 8, 17, 12553–12569, https://doi.org/10.1021/acsaem.5c01485

175. Nikhil George Mohan, Kothandaraman Ramanujam, A sonochemical alternative for nitrate to ammonia production, *Chemical Communications*, **2025**, 61, 14145-14148, https://doi.org/10.1039/D5CC02472B

174. Manavi Rajan, Sethuraman Sankararaman, Kothandaraman Ramanujam, Melt Diffusion Assisted Performance Enhancement of Organic Cathode Materials for Zinc-Ion Batteries, *ACS Electrochemistry*, **2025**, https://doi.org/10.1021/acselectrochem.5c00212

173. Kothandaraman Ramanujam, Venkataraman Thangadurai, "Professor Ashok Kumar Shukla", *Ionics, **2025**,* https://doi.org/10.1007/s11581-025-06418-7

172. Adhigan Murali and Venkatesan Natesan and Sakar Mohan and Abdullah Al Souwaileh and Aashish S. Roy and M. Raja and Kothandaraman Ramanujam and Seon Joo Park and Sung Soo Han, Insights into the amine-end-terminated fluorophore based zwitterionic poly(methyl methacrylate) quasi-solid electrolyte for flexible supercapacitors, *Journal of Molecular Liquids*,**2025**, 426,127355**,** https://doi.org/10.1016/j.molliq.2025.127355

171. Esackraj Karthikraja, Naga Venkateswara Rao Nulakani, Pandiarajan Devi, Palanichamy Murugan, Kothandaraman Ramanujam, VG Vaidyanathan, Venkatesan Subramanian, First-principles insights into biphenylene-based graphynes: promising novel two-dimensional carbon allotropes for thermoelectric applications, *Journal of Chemical Sciences,* **2025**, 137:29 DO1: https://doi.org/10.1007/s12039-025-02361-2

170. Camillie Syiemlieh Collinica, Ilango Bhuvaneesh, Kothandaraman Ramanujam, Venkatakrishnan Parthasarathy, Velusamy Marappan, Kathiravan Arunkumar, Delving into the Role of a Conjugated Rhodanine Acceptor in D–D′–A Dyes for Photovoltaic Applications, *The Journal of Physical Chemistry C*, **2025,** DOI: https://doi.org/10.1021/acs.jpcc.5c00475

169. Murali Adhigan, Venkatesan Natesan, Mohan Sakar, Al Souwaileh Abdullah, S. Roy Aashish, Raja .M, Kothandaraman Ramanujam, Joo Park Seon, Soo Han Sung Insights into the amine-end-terminated fluorophore based zwitterionic poly (methyl methacrylate) quasi-solid electrolyte for flexible supercapacitors, *Journal of Molecular Liquids*, 2025,426, 2025, 127355,DOI: https://doi.org/10.1016/j.molliq.2025.127355

168. Richa Gupta, Nikhil George Mohan, John Bell, Ashok Kumar Nanjundan, Kothandaraman Ramanujam, Fusion of Nitro Isomers of Naphthoquinone Enhances Capacity and Cyclability in Zn-ion Batteries, *Sustainable Energy Fuels*, **2025, 9**, 2207-2216 DOI: https://doi.org/10.1039/d4se01542h

167. Jeeth Sharma, Richa Gupta, Kothandaraman Ramanujam, Vaibhav Kulshrestha, Leveraging Long-Life Alkaline Redox Flow Batteries Using Durable and High-Hydroxide Exchange N-Bridged Triazine Framework membranes, *Small*, **2025**, 2406395 DOI: https://doi.org/10.1002/smll.202406395

166. Richa Gupta, Chinmaya Mirle, Kothandaraman Ramanujam, Enhancing Solubility of Anthrarufin by Tethering Alkyl Phosphonate and Mitigating Capacity Decay with Additive in Aqueous Organic Redox Flow Batteries, *Sustainable Energy Fuels*, **2025**, DOI: https://doi.org/10.1039/D4SE00838C

165. Sumanta Kumar Das, Yashwant Pratap, Kharwar Prabakaran Varathan, Kothandaraman Ramanujam, Akhila Kumar Sahu, Engineered Co/Ni–N Bonds in Bimetallic Nanocomposites for Effective Oxygen Reduction catalysts in fuel cells, *ACS Appl.Energy Mater.* **2025**, 8,2,1189–1200, DOI: https://doi.org/10.1021/acsaem.4c02709

164. Sandeep Kumar Mohapatra, Kothandaraman Ramanujam, Sankararaman Sethuraman, Tracking and Tackling the Capacity Fading in Viologen based Aqueous Organic Redox Flow Batteries, *J. Electrochem. Soc.*, **2025,** 172 010523, DOI: https://doi.org/10.1149/1945-7111/ada640

163. Duangailung Kamei, Richa Gupta, Kothandaraman Ramanujam , Nurul Alam Choudhury HQ-doped redox-active gelatin hydrogel membrane electrolytes synthesized by chemical crosslinking of gelatin with glyoxal and glutaraldehyde for solid-state EDLCs, *Ionics*, **2025**, DOI: https://doi.org/10.1007/s11581-025-06123-5

162. Anubhab Sahoo, Tejendra Dixit, Anshu Kumari, Sharad Gupta, Kothandaraman R, PP Rajeev, MS Ramachandra Rao, Sivarama Krishnan, Facile control of giant green-emission in multifunctional ZnO quantum dots produced in a single-step process: femtosecond pulse ablation, *Nanoscale Advances,* **2025,** DOI: https://doi.org/10.1039/D4NA00793J

161. Sumanta Das, Yashwant Kharwar, Prabhakaran Varathan, Kothandaraman Ramanujam, Ahila Kumar Sahu, Engineered Co/Ni-N Bonds in Bimetallic Nanocomposites for Effective Oxygen Reduction Catalysts in Fuel Cells, *ACS Applied Energy Materials*, 8, 2, 1189–1200, **2025**, DOI: https://doi.org/10.1021/acsaem.4c02709

160. Megha Bala, Nandini Jaiswal, Harun Khan, Kothandaraman Ramanujam Boron-doped carbon felt electrode on stabilizing cycle life of soluble lead redox flow battery, *Ionics*, **2024**, 024-05993-5, DOI: https://doi.org/10.1007/s11581-024-05993-5

159. Neha, Aarju Mathew, Ganapathi Rao Kandregula, Kothandaraman Ramanujam**,** Debdutta Ray, Parasuraman Swaminathan, Water-based activated carbon ink for printed

flexible biodegradable supercapacitors, *Advanced Sustainable Systems*, *9*(1), 2400649, **2024**,DOI: https://doi.org/10.1002/adsu.202400649

158. Richa Gupta, Kothandaraman Ramanujam, Turning Adversity into Advantage: Investigating Capacity Decay Mode of Carboxylate functionalized-anthraquinone in Organic Redox Flow Batteries, *ACS Applied Energy Materials*, **2024**, 7, 18, 7737–7744, DOI: https://doi.org/10.1021/acsaem.4c01123

157. Jeet Sharma, Harun Khan, Prashant Upadhyay, Amit Rajak, Sarthak Mishra, Nagalakshmi Gayathri.M, Kothandaraman Ramanujam, Vaibhav Kulshrestha, Robust sulfonated proton-exchange membrane for poly(styrene-co-divinyl benzene)melt-interpenetrated polyethylene network for vanadium redox flow batteries, *ACS Applied Energy Materials*, **2024,** 7, 7384-7396 https://doi.org/10.1021/acsaem.4c01583

156. Swati Panigrahi, Kothandaraman Ramanujam, Zein protein binder coupled with chitosan-derived carbon for polysulfide trapping in Li-S batteries, *J.Chemical Sciences*, **2024**, 136:62, DOI: https://doi.org/10.1007/s12039-024-02301-6

155. Harun Khan, Aishwarya kesh, Kothandaraman Ramanujam, A.K.Sahoo, Functionalized graphene nanofiber-based low-cost composite membrane for vanadium redox flow battery applications, *J.Chemical Sciences*,**2024,** 136, 83, DOI: https://doi.org/10.1007/s12039-024-02318-x

154. Harun Khan, Nandini Jaiswal, Nikhil C, M.S.Ramanchandra rao, Kothandaraman Ramanujam, Conformal coating of PbO_2 around boron doped diamond coated carbon felt positive electrode for stable and high-capacity operation of soluble lead redox flow battery, *J.Energy Storage*, **2024,** 99, 113304 https://doi.org/10.1016/j.est.2024.113304

153. Mohana Priya Babu, Sahana B.Moodakare, Raman Vedarajan, Kothandaraman Ramanujam, Quasi-Gel Polymer Electrolyte Interfaced with Electrodes through Solvent-Swollen Poly(ethylene oxide), for High-Performance Lithium/Lithium-Ion Batteries, *ACS Applied Materials & Interfaces*,**2024,** 16, 34, 45399–45410, DOI: https://doi.org/10.1021/acsami.4c06192

152. Kanhai Kumar , Pragyan Tripathi , Gokul Raj , Dova Kalyan , Demudu Babu Gorle , Nikhil George Mohan , Surendra Kumar Makineni , Kothandaraman Ramanujam , Abhishek Kumar Singh and Karuna Kar Nanda, Green Synthesis of Magnesium Single Atom Catalyst from Spinacia oleracea-Chlorophyll Extracts for Sustainable Electrocatalytic Nitrate Reduction to Ammonia, *Green chemistry*, 2024, **26**, 7931-7943, DOI: https://doi.org/10.1039/D4GC01422G

151. Richa Gupta, Kothandaraman Ramanujan, A highly conjugated tetrakis-lawsone organic cathode material for enhancing the capacity utilization in the zinc-ion batteries, *J. Chemical Sciences*, **2024**, 136 (19). DOI: https://doi.org/10.1007/s12039-023-02244-4

150. Ganapathi Rao Kandregula, Kothandaraman Ramanujam, Selection of Solid-State Electrolytes for lithium-ion batteries using Clustering Technique, *J. Chemical Sciences*, **2024**, 136 (38). DOI: https://doi.org/10.1007/s12039-024-02263-9

149. Debashis Mahato , Aswin Praveen, L.K. Nivedha , Tamilselvi Gurusamy, Kothandara man Ramanujam , Prathap Haridoss , Tiju Thomas, Elucidating the role of interface of Cu-Co hybrid metal oxide for oxygen reduction reaction in Zn-air batteries, *Surfaces and Interfaces*,**2024**, 46, 103924 DOI: https://doi.org/10.1016/j.surfin.2024.103924

148. Priya Vallayil, Vikas S. Padalkar, Chinmoy Nandi, Kothandaraman Ramanujam, Sethuraman Sankararaman, An Engineered Electrode of Phenazine with Suitable Binder and Carbon to Exhibit Excellent Energy and Power Density in an Aqueous Organic Zinc Ion Battery, *J. Power Sources*, **2024** ,597,234153, DOI: https://doi.org/10.1016/j.jpowsour.2024.234153

147. Anoop M, Nikhil G M, Kothandaraman R, Ramanathan S, Mechanism of Electrochemical Carbon Dioxide Reduction to Formate on Tin Electrode, *Chemical Engineering Journal*, **2024,** 482,148972, DOI: https://doi.org/10.1016/j.cej.2024.148972

146. Dipsikha Ganguly, Kothandaraman Ramanujam, Sundara Ramaprabhu, Improving Pt Utilization and Electrochemical Activity of Proton Exchange Membrane Fuel Cells Through Surface Modification of Carbon Nanotube Catalyst Support, *Energy Technology*, **2024**, 12, 2301291, DOI: https://doi.org/10.1002/ente.202301291

145. Jayasree Kumar, Nikhil George Mohan, Tamilselvi Gurusamy, Sai Manoj NVT Gorantla, Prathap Ravichandran, Kartik Chandra Mondal, Kothandaraman Ramanujam, Electrochemical Dinitrogen to Ammonia Reduction at a Nickel (II)Site: An Easy Access to Air-Stable Catalyst, *J. Mater. Chem. A*, **2024, 12**, 4473-4483, DOI: https://doi.org/10.1039/D3TA05857C "Article featured as a **HOT PAPER** ."

144. Anandhakumar Sukeri, Swati Panigrahi, and Kothandaraman Ramanujam, Sonochemically synthesized hydride-stabilized boron nanosheets via radical-assisted oxidative exfoliation for energy storage application, *Chem Comm*, **2024, 60**, 176-179. DOI: https://doi.org/10.1039/D3CC04342H (Invited Article)

143. Sandeep Kumar Mohapatra, Kothandaraman R, and Sethuraman Sankararaman, Molecular size exclusion effect extending the cycling stability of a non-aqueous redox flow battery, *APL Energy,* **2023**, 1, 036103. DOI: https://doi.org/10.1063/5.0167853

142. Sundar Sudharsan, Rajendran Rajaram Sachin Kumar, Parasuraman Swaminathan, Kothandaraman Ramanujam, Lakshman Neelakantan, Copper oxide anchored polyaniline modified glassy carbon electrode: A new sensor platform for the Amperometric determination of Chlorpyrifos, *Electrochimica Acta,* **2023,** 471, 143305. DOI: https://doi.org/10.1016/j.electacta.2023.143305

141. Sharma Jeet, Gupta Richa, Mishra Sarthak, Ramanujam, Kothandaraman, Kulshrestha Vaibhav, Sulfonated Poly (2, 6-dimethyl-1, 4-phenylene ether) Modified Mixed Matrix Bi-functional Polyelectrolyte Membrane for Long-run Anthrarufin-Based Redox Flow Battery, *ACS Applied Materials & Interfaces,* **2023**, 15, 44899. DOI: https://doi.org/10.1021/acsami.3c08089

140. Sandeep Kumar Mohapatra, Kothandaraman R, and Sethuraman Sankararaman, Benzylviologen/N-hexylphenothiazine based non-aquous organic redox flow battery in inert condition, *J. Energy Storage*, **2023**, 72, 108739. DOI: https://doi.org/10.1016/j.est.2023.108739

139. Rajaram Rajendran, Sachin Kumar, Kothandaraman Ramanujam, and Lakshman Neelakantan, Electrochemical Determination of Paraquat Using Ordered Mesoporous Carbon (CMK-3) Modified Glassy Carbon Electrode, *J. Electrochem. Soc.,* **2023,** 170, 087514. DOI: https://10.1149/1945-7111/acedd0

138. Rajaram Rajendran, Sachin Kumar, S Sudharsan, Pavul Raj Rayappan, Kothandaraman Ramanujam and Lakshman Neelakantan, Amperometric Determination of Hydrazine Using Au Nanoparticle Incorporated CMK-3 Modified Glassy Carbon Electrode, *J. Electrochem. Soc.,* **2023,** 170, 087511, DOI: https://doi.org/10.1149/1945-7111/aced70

137. Premkumar G, Toka Swu, Richa Gupta and Kothandaraman R, C-H functionalization of aromatic amines for azidation catalyzed by Betti base coordinated copper(II) complexes

under ultrasonication, *New J. Chem.,* **2023**, 47, 15677-15685. DOI: https://doi.org/10.1039/D3NJ01927F

136. Richa Gupta, Chinmaya Mirale and Kothandaraman Ramanujam, Dimerizing Lawsone into Bis(lawsone) to Counter Solubility and Attain Facile Zn^{2+} Ion Diffusion for Stable Capacity in Aqueous Zinc-Ion Batteries, *ACS Appl. Energy Mater.* **2023**, 6, 13, 7119–7128**.** DOI: https://doi.org/10.1021/acsaem.3c00799

135. Abhilipsa Sahoo, and Kothandaraman Ramanujam**,** Use of voltage for recomposing degraded redox active molecules for flow battery applications, *J. Mater. Chem. A,* **2023**, 11, 13623-13632, DOI: https://doi.org/10.1039/D3TA00624G (Invited Article)

134. Pavul Raj, Mohana Priya Babu, Raja Murugan, Muthuraj Divamahalakshmi, Kothandaraman Ramanujam**,** Confined sulfur electrode to achieve quasi-solid state sulfur conversion reaction in Li-S battery, *J. Energy Storage*, 67, 107601, **2023**, DOI: https://doi.org/10.1016/j.est.2023.107601

133. Manju P. Maman, Tamilselvi Gurusamy, Arun K. Pal, Rajkumar Jana, Kothandaraman Ramanujam, Ayan Datta and Sukhendu Mandal, Electrocatalytic Reduction of Nitrogen to Ammonia Using Tiara-like Phenylethanethiolated Nickel Cluster, *Angew. Chem. Int. Ed.* e202305462, **2023**, DOI: https://doi.org/10.1002/anie.202305462

132. Tamilselvi Gurusamy, Rajendran Rajaram, Ganapathi Rao Kandregula and Kothandaraman Ramanujam**,** Electrochemical sensing of NADH using 4 nitrobenzediazonium tetrafluoroborate salt functionalized multiwalled carbon nanotubes, *Dalton Trans.,* 52, 6041 – 6051, **2023**, DOI: https://doi.org/10.1039/D3DT00216K (Invited Article)

131. Sravani Potham, Kothandaraman Ramanujam, A novel hierarchical porous activated carbon-organic composite cathode material for high performance aqueous zinc-ion hybrid supercapacitors, *J. Power Sources*, 557, 232551, **2023**, DOI: https://doi.org/10.1016/j.jpowsour.2022.232551;

130. Ganguly Dipsikha, Ramanujam Kothandaraman, Sundara Ramaprabhu, Low-temperature synthesized Pt_3Fe alloy nanoparticles on etched carbon nanotubes catalyst support using oxygen-deficient Fe_2O_3 as catalytic centre for PEMFC applications, *ACS Sustainable Chem. Eng.* 11, 3334–3345, **2023**, DOI: https://doi.org/10.1021/acssuschemeng.2c06453

129. Suriyanarayanan Subramanian, Babu Mohana Priya, Murugan Raja, Muthuraj Divamahalakshmi, Ramanujam Kothandaraman, Nicholls Ian**,** Highly efficient and recycling of cobalt from spent lithium ion batteries using an N-methylurea-acetamide non-ionic deep eutectic solvent, *ACS Omega*, 8, 6959–6967, **2023**, DOI: https://doi.org/10.1021/acsomega.2c07780

128. Priya Vallayil, Sethuraman Sankararaman, Kothandaraman Ramanujam, Structurally and electrochemically tunable pyrylium platforms: A new class of redox anolyte for non-aqueous organic redox flow battery operating at a high-current density, *J. Energy Storage,* 58, 106325, **2023**, DOI: https://doi.org/10.1016/j.est.2022.106325

127. Subramanian Suriyanarayanan, Sudip Mandal, Kothandaraman Ramanujam, Ian A.Nicholls, Smart bio-nano interface derived from zein protein as receptors for biotinyl moiety*, Talanta,* 256, 124298, **2023**, DOI: https://doi.org/10.1016/j.talanta.2023.124298

126. Subramanian Suriyanarayanan, Ganapathi Rao Kandregula, Kothandaraman Ramanujam, Ian A. Nicholls, Sustainable synthesis of hierarchically grown chloramphenicol-imprinted poly(caffeic acid) nanostructured thin films, *J. Appl. Polym. Sci*., 140, e53560, **2023**, DOI: https://doi.org/10.1002/app.53560

125. Jeet Sharma, Harun Khan, Prashant Upadhyay, Ramanujam Kothandaraman, Vaibhav Kulshrestha, Stable Poly(2,6-dimethyl-1,4-phenylene ether) Based Cross-Linked Cationic Polyelectrolyte Membrane with Ionic Microstructure Modification for Efficient VRFB Performance, *ACS Appl. Energy Mater.* 6, 447-460, **2023**, DOI: https://doi.org/10.1021/acsaem.2c03421;

124. Tamilselvi G, Nikhil George M, Ganapathi Rao K, Dhinesh Kumar M, Ramanathan S, Kothandaraman R, Mechanistic analysis of the dissociative reduction of nitrogen to ammonia by $ZnMn_2O_4$ catalyst derived from spent batteries, *Catalysis Today*, **2023**, 423, 113898. DOI: https://doi.org/10.1016/j.cattod.2022.09.004

123. Vivekananda Mahanta, Richa Gupta, Kothandaraman Ramanujam, Hydrobromide Salt of Tribromodopamine as a Positive Electroactive Species with a Three-Electron Redox Process for Redox Flow Battery Applications, *ACS Appl. Energy Mater.* 5, 15166−15174, **2022,** DOI: https://doi.org/10.1021/acsaem.2c02833

122. Harun Khan, M. Raja, N.V.Sarma, M. Nagarajan, J. Ramesh, G.A. Pathanjali , Damaraju Parvatalu, Saroj Chaudhary, R. Kothandaraman, Design, Development, and Demonstration of a 1kW/10kWh Vanadium Redox Flow Battery System Minimizing Shunt Current Losses, *J. Electrochem Soc. India*, 71, 45-50, **2022**.

121. D Mahato, Tamil Selvi G, SK Jain, K Ramanujam, P Haridoss, T Thomas, CuO modified ZnO on nitrogen-doped carbon: a durable and efficient electrocatalyst for oxygen reduction reaction, *Mater. Today Chem*., 26, 101167, **2022,** DOI: https://doi.org/10.1016/j.mtchem.2022.101167;

120. LK Nivedha, Dhinesh Kumar M, Ganapathi Rao K, Raja M, Kothandaraman R, $ZnMn_2O_4$/Carbon Composite Recycled from Spent Zinc-Carbon Batteries for Zn-Air Battery Applications, *J. Electrochem. Soc.* 169 , 100544, **2022,** DOI: 10.1149/1945-7111/ ac9a7c

119. Venkatesan N, Kesavan T, Raja M, Kothandaraman R, Nishad Fathima N, Efficient electrochemical performance of nitrogen-doped porous activated carbon for high energy symmetric pouch cell supercapacitors**,** *J. Energy Storage,* 30, 105698, **2022,** DOI: https://doi.org/10.1016/j.est.2022.105698;

118. T. Kesavan, M. Raja and R. Kothandaraman, Rationally designed N/P-dual doped ordered mesoporous carbon for supercapacitors, *J. Mater. Sci.,* 57 (36), 17380-17397, **2022**, DOI: https://doi.org/10.1007/s10853-022-07733-4

117. M. Debashis, G. Tamilselvi, R. Kothandaraman, P. Haridossa and TijuThomasac, Unravelling the role of interface of CuOx-TiO2 hybrid metal oxide in enhancement of oxygen reduction reaction performance, *Int. J. Hydrog. Energy, 47***,** 34048-34065, **2022,** DOI: http://doi.org/10.1016/j.ijhydene.2022.08.016;

116. Ganapathi Rao Kandregula, R. J. Naik and Kothandaraman, R 3D Prussian Blue Decorated Porous Carbon Composite Electrode for Advanced Asymmetric Supercapacitor Applications, *J. Energy Storage,* 54, 105291, **2022**, DOI: https://doi.org/10.1016/j.est.2022.105291

115. Nandini J, Harun Khan, Kothandaraman R, The combined impact of trimethyloctadecylammonium chloride (TMOAC) and sodium fluoride on cycle life and energy efficiency of soluble lead-acid redox flow battery, *J. Energy Storage*, 54, 105243, **2022**, DOI: https://doi.org/10.1016/j.est.2022.105243;

114. Chinmaya Mirle a nd Kothandaraman R, On capacity up-gradation and in-situ capacity rebalancing in anthrarufin based alkaline redox flow battery, *ACS. Appli. Energ. Mater*, 5, 9711–9721, **2022**, DOI: https://doi.org/10.1021/acsaem.2c01392;

113. Anish Satpati, Ganapathi Rao Kandregula, and Kothandaraman R, Machine Learning enabled High-Throughput Screening of Inorganic Solid Electrolytes for Regulating

Dendritic Growth in Lithium Metal Anodes, *New. J. Chem.,* 46, 14227-14238, **2022**. DOI: 10.1039/D2NJ01827F;

112. Yaswanth P, Tamilselvi G, Sudip Mandal and Kothandaraman R, Copper-Based Non-Precious Metal Catalysts Derived from the In-Situ and_Ex-Situ Loading of Copper-bipyridine Metal-Organic Framework on Activated Carbon for Oxygen Reduction Reaction, *J. Chem. Sci.,* 134, 75, **2022**, DOI: https://doi.org/10.1007/s12039-022-02067-9;

111._Sumana. B, Kothandaraman. R and Ramesh Gardas, Nitrogen-Doped High Surface Area Porous Carbon Material Derived from Biomass and Ionic Liquid for High-Performance Supercapacitors, *Ind. Eng. Chem. Res*.,61, , 12073-12082, **2022**. DOI: https://doi.org/10.1021/acs.iecr.2c00195;

110. Nagarani Sandhiran, Sasikala Ganapathy, Yuvaraj Manoharan, Dipsikha Ganguly, Mohan raj Kumar, Kothandaraman Ramanujam and Subramanian Balachandran, CuO–NiO binary transition metal oxide nanoparticle anchored on rGO nanosheets as high-performance electrocatalyst for the oxygen reduction reaction, *Environ. Res*., 211, **2022**, 112992, DOI: https://doi.org/10.1016/j.envres.2022.112992;

109. Nandini Jaiswal, Harun Khan, and Kothandaraman R, Recent Developments and Challenges in Membrane-Less Soluble Lead Redox Flow Batteries, *J. Electrochem.Soc*., 169, , 040543, **2022,** DOI: https://doi.org/10.1149/1945-7111/ac662a

108. Dariusz M Niedzwiedzki, Divya Unny, Ganapathi Rao Kandregula and Kothandaraman R, Excited-state properties of newly sensitized imidazole-arylamine-based organic DSSC sensitizers insolvent and adsorbed on TiO2/FTO support, *Dyes & Pigm*., 202, **2022**, 110273, DOI: https://doi.org/10.1016/j.dyepig.2022.110273

107. Vivekananda Mahanta and Kothandaraman R, Vanadium - Polydopamine Flow Battery, *J. Electrochem. Soc*., 169, **2022,** 030525**,** DOI: https://doi.org/10.1149/1945-7111/ac5ad3;

106. Rajendran Rajaram, Tamilselvi Gurusamy, Kothandaraman Ramanujam, Lakshman Neelakantan, Electrochemical determination of paraquat using gold nanoparticle incorporated multiwalled carbon nanotubes, *J. Electrochem. Soc*., 169, **2022**, 047522, DOI: doi.org/10.1149/1945-7111/ac5bae;

105. Ganapathi Rao Kandregula, M. Dhinesh Kumar, N. Arul Murugan, and R. Kothandaraman, Data-driven Approach Towards Identifying Dye-Sensitizer Molecules for

Higher Power Conversion Efficiency in Solar Cells, *New. J. Chem*., 46, 4395-4405, **2022**, DOI: https://doi.org/10.1039/D1NJ05498H;

104. Jagadeeswari S, Raja Murugan, Harun Khan, Indrapal Singh Aidhen and Kothandaraman Ramanujam, Investigation of alkyl amine substituted quinone derivatives for the redox flow battery applications in acidic medium, *J. Electrochem. Soc*., 169, 020533, **2022**, DOI: https://doi.org/10.1149/1945-7111/ac505f;

103. B. Sumana and R. Kothandaraman, Combination of redox-active natural indigo dye and bio-derived carbon from ridge gourd fruit for high-performance asymmetric supercapacitors, *Ionics,* 28, 1427-1440, **2022,** DOI: https://doi.org/10.1007/s11581-021-04433-y;

102. V. Priya, R. Kothandaraman and S. Sankararaman, A new 2,3-Dimethoxy-1,4-naphthoquinone redox anolyte for non-aqueous organic static redox battery, *Electrochimica Acta*, 407, 139889**, 2022,** DOI: 10.1016/j.electacta.2022.139889;

101. M. Divyamahalakshmi, M. Raja, R. Pavul Raj, Ganapathi Rao Kandregula and R. Kothandaraman, Dual-role Magnesium Aluminate Ceramic Film as an Advanced Separator and Polysulfide Trapper in Li-S battery: Experimental and DFT investigations, *New. J. Chem.,* 46, 3185-3198, **2022**, DOI: 10.1039/D1NJ05347G;

100. G. Tamilselvi, R. Rajaram, M. Raja and R. Kothandaraman, A web of poly bis(benzimidazolato)copper (II) around multiwalled carbon nanotubes for the electrochemical detection of hydrogen peroxide, *New. J. Chem.,* 46, 1222-1231, **2022**, DOI: 10.1039/D1NJ04903H;

99. U. Divya, Ganapathi Rao Kandregula and R. Kothandaraman, Starburst configured imidazole-arylamine organic sensitizers for DSSC applications, *J. Photochem. Photobiol. A Chem.,* 426, 113735, **2022,** DOI: https://doi.org/10.1016/j.jphotochem.2021.113735

98. Harun Khan, M. Raja and R. Kothandaraman, Bilayer Micro-Mesoporous Membrane Assembly Offering Lower Pressure Drop to Realize High Energy Efficient Vanadium Redox Flow Battery, *J. Electrochem. Soc*., 168, 100542**, 2021**, DOI: https://doi.org/10.1149/1945-7111/ac3114;

97. K. Ganapathi Rao, M. Sudip M. R. Chinmaya and R. Kothandaraman, A computational Approach on Engineering Short Spacer for Carbazole based Dyes for Dye-sensitized Solar Cells, *J. Photochem. Photobiol. A Chem*., 419, 113447, **2021**, DOI: https://doi.org/10.1016/j.jphotochem.2021.113447;

96. P K. Yaswanth, G. Tamilselvi, M. Sudip and R. Kothandaraman, Activation of Oxygen Reduction Reaction on Carbon Supported Ni-Based Complexes, *ChemistrySelect*, 6, 9101-9111, **2021,** DOI: https://doi.org/10.1002/slct.202101231;

95. R. J. Naik, P. Sravani and R. Kothandaraman, Energy-dense aqueous carbon/carbon supercapacitor with a wide voltage window, *J. Electrochem. Soc*., 168, 70538, **2021**, DOI: https://doi.org/10.1149/1945-7111/ac1319;

94. G. Dipsikha, R. Kothandaraman, S. Ramaprabhu, Platinum Nanoparticles Decorated Expired Drug-derived N-Doped Ketjenblack Carbon as Efficient Catalyst for PEM Fuel Cells*, J. Electrochem. Soc*., 168, 64517, **2021,** DOI: https://doi.org/10.1149/1945-7111/ac0bef;

93. M. Debashis, P. K. Yashwant, R. Kothandaraman, H. Prathap and TijuThomas, S, N Co-Doped Graphene Quantum Dots Decorated TiO_2 and Supported with Carbon for Oxygen Reduction Reaction, *Int. J. Hydrog. Energy*, 16, 21549-21565, **2021**, DOI: https://doi.org/10.1016/j.ijhydene.2021.04.013;

92. K. Ganapathi Rao, M. Sudip and R. Kothandaraman, Molecular engineering of near-infrared active boron dipyrromethene moiety with various donors and acceptors for tuning the absorption behavior and electron injection of the resultant dyes, *J. Photochem. Photobiol. A Chem,* 410, 113161, **2021**, DOI: https://doi.org/10.1016/j.jphotochem.2021.113161;

91. M. Raja, Harun Khan, S Sankarasubramanian, D. Sonawat, V. K. Ramani and R. Kothandaraman, Binder-free thin graphite fiber mat sandwich electrode architectures for energy-efficient vanadium redox flow batteries*, Catalysis Today*, 370, 181-188**, 2021,** DOI: https://doi.org/10.1016/j.cattod.2021.02.012;

90. Janraj Naik Ramavath, M. Raja, K. Balakumar and R. Kothandaraman, An Energy and Power Dense Aqueous Zinc-Ion Hybrid Supercapacitor with Low Leakage Current and Long Cycle Life, *J. Electrochem. Soc.,* 168, 010538, **2021**, DOI: https://doi.org/10.1149/1945-7111/abdc7a;

89. M. R. Chinmaya, M. Veerababu and R. Kothandaraman, Electrode and conductive additive compatibility yielding excellent rate capability and long cycle life for sustainable organic aqueous Zn-ion batteries, *ACS Applied Energy Materials*, 4, 1218, **2021**, DOI: https://doi.org/10.1021/acsaem.0c02511

88. L. K. Nivedha, M. Raja, R. Kothandaraman, Interplay of the functional units of a binder in the oxygen reduction process of zinc-air battery, *Catalysis Today*, 370, 66-74, **2021**, DOI: https://doi.org/10.1016/j.cattod.2020.09.022;

87. M. R. Chinmaya and M. Veerababu and R. Kothandaraman, Crossover-free hydroxy-substituted quinone anolyte and potassium ferrocyanide catholyte for aqueous alkaline organic redox flow battery, *Catalysis Today*, 370, 173-180, **2021,** DOI: https://doi.org/10.1016/j.cattod.2020.12.012;

86. M. Vivekananda, M. Raja, Harun Khan, and Kothandaraman R, Drastic Improvement in Capacity-Retention and Polarization of Vanadium Redox Flow Battery with Hydrophilic Co_3O_4 Nanostructure Modified Activated Graphite Felt Electrodes, *J. Electrochem. Soc.,* 167, 160504, **2020**, DOI: https://doi.org/10.1149/1945-7111/abc90a;

85. M. R. Chinmaya, M. Raja, Vasudevarao P, Kothandaraman R and Sankararaman S, Functionalised carbazole as a cathode for high voltage non-aqueous organic redox flow batteries, *New J. Chem.,* 44, 14401-14410**, 2020,** DOI: https://doi.org/10.1039/D0NJ02543G;

84. Kharwar, Yashwant Pratap, Srinu Akula, Akhila Kumar Sahu, and Kothandaraman R, Highly Durable Pt-Based Catalyst Supported on Carbon Derived from Tamarind Seeds for Oxygen Reduction Reaction in PEM Fuel Cell*, J. Electrochem. Soc*., 167, 104515, **2020,** DOI: https://doi.org/10.1149/1945-7111/ab9c7c;

83. D. Unny, G.R. Kandregula, J. Sivanadanam, K. Ramanujam, Molecular engineering of pyrene carbazole dyes with a single bond and double bond as the mode of linkage, *New J. Chem.*, 44, 16511-16525, **2020**, DOI: https://doi.org/10.1039/D0NJ03228J;

82. G. Tamilselvi, M. Raja M, D. Akalya, R. Kothandaraman, Confinement Catalysis of Non-covalently Functionalized Carbon Nanotube in Ascorbic Acid Sensing, *Electroanalysis*, 32, 2481- 2492, **2020**, DOI: https://doi.org/10.1002/elan.202060119;

81. A. Rajput, H. Khan, S.K. Raj, R. Kothandaraman and V. Kulshrestha, Styrene- co -DVB grafted PVDF proton exchange membranes for vanadium redox flow battery applications, *Mater. Adv*., 1, 1930, **2020,** DOI: 10.1039/D0MA00496K;

80. S. Mandal, G.R. Kandregula, R. Kothandaraman, replacing aromatic π-system with cycloalkyl in triphenylamine dyes to impact intramolecular charge transfer in dyes pertaining to dye-sensitized solar cells application, *J. Photochem. Photobiol. A Chem*., 403, 112862, **2020**, DOI: https://doi.org/10.1016/j.jphotochem.2020.112862;

79. P. Mani, A. Sheelam, P.E. Karthik, R. Sankar, R. Kothandaraman, S. Mandal, Nickel-Based Hybrid Material for Electrochemical Oxygen Redox Reactions in an Alkaline Medium, *ACS Appl. Energy Mate*r., 3, 6415, **2020**, DOI: https://doi.org/10.1021/acsaem.0c00615

78. U. Naveen Kumar, Janraj Naik Ramavath, Sourav Ghosh, Tiju Thomas and R. Kothandaraman, Chromium oxynitride as durable electrode materials for symmetric supercapacitors, *Batteries & Supercaps*, 3, 780-788, **2020**, DOI: https://doi.org/10.1002/batt.201900225;

77. J. Vanshika, G. Tamilselvi, P. Gayathri and R. Kothandaraman, Oxygen sensitive 1-amino-2-naphthol immobilized functionalized-carbon nanotube electrode, *New J. Chemistry*, 44, 8849-8858, **2020**, DOI: https://doi.org/10.1039/D0NJ00438C

76. Ganapathi Rao Kandregula, S. Jagadeeswari, and R. Kothandaraman, Drastic improvement in dye-sensitized solar cell efficiency by electrosorption based dye staining of Titania semiconductor photoanode, *Electrochimica Acta*, 349, 136344, **2020**, DOI: https://doi.org/10.1016/j.electacta.2020.136344

75. S. Jagadeeswari, Indrapal Singh Aidhen and R. Kothandaraman, New cyclic and acyclic imidazole-based sensitizers for achieving highly efficient photoanodes for dye-sensitized solar cells by potential assisted method, *New J. Chemistry,* 44, 10207-10219, **2020**, DOI: https://doi.org/10.1039/D0NJ00137F;

74. V. Srinivasan, S. Jagadeeswari, R. Kothandaraman, and Mariadoss Asha Jhonsi, Delineating the enhanced efficiency of carbon nanomaterials including the hierarchical architecture of the photoanode of dye-sensitized solar cells, *Mater. Adv*., 1, 2964-2970, **2020**, DOI: 10.1039/D0MA00654H

73. D. M. Niedzwiedzki and G. R. Kandregula and S. Jagadeeswari and R. Kothandaraman, Excited State Properties of Metal-Free (D2d and T-SB-C) and Ru-Based (N719 and Z907) Dyes and Photoinduced Charge Transfer Processes in FTO/$TiCl_4$/TiO_2/Dye Photoanodes Fabricated by Conventional Staining and Potential-Assisted Adsorption, *J. Phys. Chem. A*, 124, 22, 4333-4344, **2020,** DOI: https://doi.org/10.1021/acs.jpca.0c00653

72. Ganapathi Rao Kandregula, Sudip Mandal, Prince Gollapalli, Satyesh Yadav, and R. Kothandaraman, A computational study on boron dipyromethene ancillary acceptor-based dyes for dye-sensitized solar cells, *New J. Chem.,* 44, 4877-4886, **2020**, DOI: https://doi.org/10.1039/C9NJ05334D;

71. J. Prerna, R. Vedarajan, S. Anjaiah, R. Kothandaraman, Bernard Malaman, and Noriyoshi Matsumi, An all solid-state Li-ion battery composed of low molecular weight crystalline electrolyte, *RSC Advances* 10, 8780-8789. **2020**, DOI: https://doi.org/10.1039/C9RA09559D;

70. M. Prabu, D. Sharat, G. Tamilselvi, E. Karthik, B. P. Ratheesh, R. Kothandaraman and S. Mandal, Sodalite-type Cu-based Three-dimensional Metal-Organic Framework for Efficient Oxygen Reduction Reaction, *Chem. An Asian J.*, 14, 4814-4818, **2019**, DOI: https://doi.org/10.1002/asia.201901242;

69. G. Tamilselvi, B. Abhishek, R. Kothandaraman, and N. Chandra Kumar, Electrochemical Sensors Using Liquid Filled Multiwalled Carbon Nanotubes: Enhanced Sensor Characteristics, and NMR Relaxometry Evidence of Liquid Confinement, *J. Electrochem. Soc*., 166, B1186-B1195, **2019**, DOI: https://doi.org/10.1149/2.0831913jes ;

68. P. Vasudeva rao, and R. Kothandaraman, Paper-Based Disposable Zinc-Vanadium Fuel Cell for Micropower Applications, *ChemistrySelect*, 4, 8398 - 8403, **2019**, DOI: https://doi.org/10.1002/slct.201802624;

67. J. N. Ramavath, M. Raja, Sanjeet Kumar, and R. Kothandaraman, Mild acidic mixed electrolyte for high-performance electrical double layer capacitor, *Appl. Surf. Sci*., 489, 867-874, **2019,** DOI: https://doi.org/10.1016/j.apsusc.2019.05.343;

66. P. K. Yashwant, Sudip Mandal, and R. Kothandaraman, Carbon Supported and Nafion Stabilized Copper (II) Based 1D Coordination Polymer as an Electrocatalyst for Oxygen Reduction Reaction, *J. Electrochem. Soc*., 166, F3193-F3201, **2019**, DOI: https://doi.org/10.1149/2.0221907jes;

65. Vivekananda Mahanta, M. Raja, and R. Kothandaraman**,** Activated carbon from sugarcane bagasse as a potential positive electrode catalyst for vanadium redox flow battery*, Materials Letters*, 247, 63-66, **2019, DOI:** https://doi.org/10.1016/j.matlet.2019.03.045;

64. M. Raja, B. Sadhasivam, R. Dhamodharan, R. Kothandaraman, A chitosan/poly (ethylene glycol)-ran-poly (propylene glycol) blend as an eco-benign separator and binder for quasi-solid-state supercapacitor applications, *Sustainable energy & fuels*, 3(3), 760-773, **2019**, DOI: https://doi.org/10.1039/C8SE00530C;

63. G. Dipsikha, S. Ramprabhu, R. Kothandaraman, Chemical Vapor Deposition-Grown Nickel-Encapsulated N-Doped Carbon Nanotubes as a Highly Active Oxygen Reduction

Reaction Catalyst without Direct Metal-Nitrogen Coordination, *ACS omega*, 3(10), 13609-13620**, 2018**, DOI: https://doi.org/10.1021/acsomega.8b01565;

62. M. Veerababu, R. Kothandaraman, Glycination: A Simple Strategy to Enhance the Cycling Performance of Perylene Dianhydride for Secondary Li-Ion Battery Applications, *ChemistrySelect*, 3(38), 10657-10662, **2018**, DOI: https://doi.org/10.1002/slct.201801588;

61. J. N. Ramavath, M. R. Chinmaya, R. Kothandaraman, Iron-Dicyano Dichloro Quinone Primary Battery, *Chemistry Select*, 3(37), 10281-10286, **2018**, DOI: https://doi.org/10.1002/slct.201801878;

60. P. Vasudeva rao, M. R. Chinmaya, S. Shankararaman, R. Kothandaraman, A High Voltage Organic Redox Flow Battery with Redox Couples O_2/Tetrabutylammonium Complex and Tris (4-bromophenyl) amine as Redox Active Species, *J. Electrochem. Soc.,* 165(11), A2696, **2018,** DOI: https://doi.org/10.1149/2.0661811jes;

59. P. Vasudeva rao, J. N. Ramavath, C. He, V. K. Ramani and R. Kothandaraman, N-and P-co-doped Graphite Felt Electrode for Improving Positive Electrode Chemistry of the Vanadium Redox Flow Battery, *ChemistrySelect,* 3(30), 8678-8687, **2018, DOI:** https://doi.org/10.1002/slct.201801446;

58. S. Jagadeswari, M. Sudip, Aidhen, I. S and R. Kothandaraman, Design of Cone-Shaped Hole Transporting Material Organic Structures for Perovskite Solar Cells Applications, *ChemistrySelect,* 3(28), 8159-8166, **2018,** DOI: https://doi.org/10.1002/slct.201801824;

57. G. Tamilselvi, P. Gayathri, M. Sudip and R. Kothandaraman, Redox-Active Copper-Benzotriazole Stacked Multiwalled Carbon Nanotubes for the Oxygen Reduction Reaction, *ChemElectroChem*, 5(14), 1837-1847, **2018**, DOI: https://doi.org/10.1002/celc.201800110 **(Invited Article)**

56. R. Kothandaraman, T. Thirupathi, Carbon supported g-C_3N_4 for electrochemical sensing of hydrazine, *Electrochemical Energy Technology*, 4(1), 21-31, **2018,** DOI: https://doi.org/10.1515/eetech-2018-0003 ;

55. K. Rajavelu, M. Sudip, R. Kothandaraman and P. Rajakumar, Synthesis and DSSC application of triazole bridged dendrimers with benzoheterazole surface groups, *Solar Energy*, 166, 379-389, **2018,** DOI: https://doi.org/10.1016/j.solener.2018.03.071;

54. M. Sudip, R. Vedarajan, Matsumi, N., and R. Kothandaraman, Computational Investigation of the Influence of π-Bridge Conjugation Order of Thiophene and Thiazole Units in Triphenylamine Based Dyes in Dye-Sensitized Solar Cells, *ChemistrySelect,* 3(13), 3582-3590, **2018,** DOI: https://doi.org/10.1002/slct.201702882;

53. P. Mani, A. Sheelam, S. Das, G. Wang, V. K. Ramani, R. Kothandaraman and S. Mandal, Cobalt-based coordination polymer for oxygen reduction reaction, *ACS Omega,* 3(4), 3830-3834, **2018,** DOI: https://doi.org/10.1021/acsomega.8b00088;

52. S. Jagadeswari, R. Mukkamala, M. Sudip, S. R Vedarajan, N. Matsumi, I. S. Aidhen, and R. Kothandaraman, Exploring the role of the spacers and acceptors on the triphenylamine-based dyes for dye-sensitized solar cells, *Int. J. Hydrog. Energy*, 43(9), 4691-4705, **2018,** DOI: https://doi.org/10.1016/j.ijhydene.2017.10.183;

51. A. Sheelam, R. Kothandaraman, Iron (III) chloride-benzotriazole adduct for oxygen reduction reaction in alkaline medium, *Int. J. Hydrog. Energy*, 43(9), 4754-4762**, 2018**, DOI: https://doi.org/10.1016/j.ijhydene.2017.10.115;

50. S. Mandal, S. Suriyanarayanan, I. A. Nicholls, and R. Kothandaraman, Selective Sensing of the Biotinyl Moiety Using Molecularly Imprinted Polyaniline Nanowires, *J. Electrochem. Soc*., 165(14), B669-B678, **2018**, DOI: https://doi.org/10.1149/2.0401814jes;

49. M. Veerababu, N. Kuanr and R. Kothandaraman, Sodium Naphthalene Dicarboxylate Anode Material for Inorganic-Organic Hybrid Rechargeable Sodium-Ion Batteries, *J. Electrochem. Soc.,* 165(2), A175-A180, **2018,** DOI: https://doi.org/10.1149/2.0731802jes;

48. P. Gayathri and R. Kothandaraman, Redox Active Cobalt-Bipyridine Metal Organic Framework-Nafion Coated Carbon Nanotubes for Sensing Ascorbic Acid*, J. Electrochem. Soc*., 165(13), B603-B609, **2018**, DOI: https://doi.org/10.1149/2.0661813jes;

47. U. Dhivya, S. Jagadeswari, M. Sudip, I. S. Aidhen, and R. Kothandaraman, Effect of Flexible, Rigid Planar and Non-Planar Donors on the Performance of Dye-Sensitized Solar Cells, *J. Electrochem. Soc.,* 165(13), H845-860, **2018**, DOI: https://doi.org/10.1149/2.0551813jes

46. R. Verma, C.J. Park, R. Kothandaraman and V. U. Varadaraju, Ternary lithium molybdenum oxide, $Li_2Mo_4O_{13}$: A new potential anode material for high-performance rechargeable lithium-ion batteries, *Electrochimica Acta,* 258, 1445-1452, **2017**, DOI: https://doi.org/10.1016/j.electacta.2017.12.008;

45. S. Suriyanarayanan, M. Sudip, R. Kothandaraman, and I. A. Nicholls, Electrochemically synthesized molecularly imprinted polythiophene nanostructures as recognition elements for an aspirin-chemosensor, *Sensors and Actuators B: Chemical*, 253, 428-436, **2017**, DOI: https://doi.org/10.1016/j.snb.2017.05.076;

44. M. Sudip, S. Rao and R. Kothandaraman, Understanding the photo-electrochemistry of metal-free di and tri substituted thiophene-based organic dyes in dye-sensitized solar cells using DFT/TD-DFT studies, *Ionics,* 23(12), 3545-3554, **2017,** DOI: https://doi.org/10.1007/s11581-017-2158-y;

43. S. Kushwaha, M.P. Karthikayini, G. Wang, M. Sudip, A. P. Bhobe, V. K. Ramani, R. Kothandaraman, A non-platinum counter electrode, MnNx/C, for dye-sensitized solar cell applications, *Appl. Surf. Sci.,* 418, 179-185, **2017,** DOI: https://doi.org/10.1016/j.apsusc.2016.12.140;

42. M. Veerababu, G. Wang, V. K. Ramani and R. Kothandaraman, Lithium salt of biphenyl tetracarboxylate as an anode material for Li/Na-ion batteries, *Appl. Surf. Sci.,* 418, 9-16, **2017**, DOI: https://doi.org/10.1016/j.apsusc.2016.12.041;

41. R. Verma, R. Kothandaraman and U. V. Varadaraju, In-situ carbon coated $CuCo_2S_4$ anode material for Li-ion battery applications, *Appli. Surf. Sci.,* 418, 30-39, **2017**, DOI: https://doi.org/10.1016/j.apsusc.2016.11.165 ;

40. B. Sathiya, S. Anjaiah, R. Kothandaraman, R. Dhamodharan, Green, Seed-Mediated Synthesis of Au Nanowires and Their Efficient Electrocatalytic Activity in Oxygen Reduction Reaction, *ACS Appli. Mater. Interfaces*, 9(34), 28876-28886, **2017**, DOI: https://doi.org/10.1021/acsami.7b07553;

39. P. Vasudeva Rao and R. Kothandaraman, Flexible paper-based borohydride-vanadium fuel cell for powering micro-nanosystems, *Ionics*, 23(7), 1811-1817, **2017**, DOI: https://doi.org/10.1007/s11581-017-1987-z;

38. M. Veerababu and R. Kothandaraman, Introduction of Carbonyl Groups: An Approach to Enhance Electrochemical Performance of Conjugated Dicarboxylate for Li-Ion Batteries, *J. Electrochem. Soc.*, 164 (7), A1720, **2017**, DOI: https://doi.org/10.1149/2.1581707jes;

37. D. N. Joshi, M. Sudip, R. Kothandraman, R. A. Prasath, Efficient light harvesting in dye sensitized solar cells using broadband surface plasmon resonance of silver nanoparticles with varied shapes and sizes, *Materials Letters,* 193, 288-291, **2017,** DOI: https://doi.org/10.1016/j.matlet.2017.02.008;

36. M. Veerababu and R. Kothandaraman, Rational functionalization of perylene diimide for stable capacity and long-term cycling performance for Li-ion batteries, *Electrochimica Acta,* 232, 244-253, **2017**, DOI: https://doi.org/10.1016/j.electacta.2017.02.152;

35. P. Vasudeva rao and R. Kothandaraman, On In–situ Redox Balancing of Vanadium Redox Flow Battery Using D-Fructose as Negative Electrolyte Additive, *ChemistrySelect*, 2(2), 720-727, **2017,** DOI: https://doi.org/10.1002/slct.201601417;

34. M. Veerababu, N. Kuanr, R. Kothandaraman, Reversible Sodium Storage Behaviour of Aromatic Diimide Disodium Carboxylates, *J. Electrochem. Soc*., 164(1), A6147-A6153**, 2016,**DOI: https://doi.org/10.1149/2.0221701jes;

33. S. Anjaiah, and R. Kothandaraman, Metal-Organic Complexes, [Co (bpy) $_3$] $(NO_3)_2$ and [Co (bpy) $2NO_3$] $NO_3 \cdot 5H_2O$, for Oxygen Reduction Reaction*, J. Electrochem. Soc*., 164(9), F1022-F1029, **2017,** DOI: https://doi.org/10.1149/2.0141712jes;

32. P. Gayathri, and R. Kothandaraman, Aquotris (benzotriazole) sulfatocopper (II). benzotriazole Framework Assembled on Multiwalled Carbon Nanotubes through π-π Interaction for H_2O_2 Sensing in pH 7 Buffer Solution, *J. Electrochem. Soc.,*164 (12), 2017, B591-B601, **2017**, DOI: https://doi.org/10.1149/2.0011713jes;

31. M. P. Karthikayini, G. Wang, P. A. Bhobe, S. Anjaiah, V. K. Ramani, K. R. Priolkar, and R. Kothandaraman, Effect of protonated amine molecules on the oxygen reduction reaction on metal-nitrogen-carbon-based catalysts, *Electrocatalysis,* 8(1), 74-85, **2017,** DOI: https://doi.org/10.1007/s12678-016-0341-y;

30. K. Suman, M. Sudip, S. Subramanian, S. Aryasomayajul, and R. Kothandaraman, A DSSC with an Efficiency of∼ 10%: Fermi Level Manipulation Impacting the Electron Transport at the Photoelectrode-Electrolyte Interface, *ChemistrySelect*, 1(19), 6179-6187, **2016**, DOI: https://doi.org/10.1002/slct.201601461;

29. M. Sudip and R. Kothandaraman, DFT/TD-DFT Studies of Metal-Free N-Annulated Perylene Based Organic Sensitizers for Dye-Sensitized Solar Cells: Is Thiophene Spacer Essential for Improving the DSSC Performance? *ChemistrySelect*, 1(18), 5854-5862, **2016**, DOI: https://doi.org/10.1002/slct.201600868;

28. S. Anjaiah, M. Sudip, T. Thippani, V. Ramkumar and R. Kothandaraman, Carbon-supported Co (III) dimer for oxygen reduction reaction in alkaline medium*, Ionics,* 22(11), 2183-2194, **2016**, DOI: https://doi.org/10.1007/s11581-016-1730-1;

27. Sheelam, A and R. Kothandaraman, Nitrogen functionalized few layer graphene derived from metal-organic compound: a catalyst for oxygen reduction reaction, *Electrochimica Acta,* 216, 457-466, **2016**, DOI: https://doi.org/10.1016/j.electacta.2016.09.006;

26. Rakesh Verma, R. Kothandaraman, and U. V. Varadaraju, Nanocrystalline $Na_2Mo_2O_7$: A new high performance anode material, *Electrochimica Acta,* 215, 192-199, **2016**, DOI: https://doi.org/10.1016/j.electacta.2016.08.094;

25. M. Suman, K. Suman, R. Mukkamala, V. K. Siripina, I. S. Aidhen, B. Rajakumar, Band R. Kothandaraman, Metal-free bipolar/octupolar organic dyes for DSSC application: A combined experimental and theoretical approach, *Organic Electronics*, 36, 177-184, **2016,** DOI: https://doi.org/10.1016/j.orgel.2016.06.009;

24. Rakesh Verma, R. Kothandaraman and U. V. Varadaraju, Disodium dimolybdate: a potential high-performance anode material for rechargeable sodium ion battery applications, *J. Solid-State Electrochem*., 20(5), 1501-1505, **2016**, DOI 10.1007/s10008-016-3153-3;

23. M. Veerababu, U. V. Varadaraju, and R. Kothandaraman, Reversible lithium storage behavior of aromatic diimidedilithium carboxylates, *Electrochimica Acta*, 193, 80-87, **2016,** DOI: https://doi.org/10.1016/j.electacta.2016.02.030;

22. S. Debraj, Purna Chandra Rao, H. B. Aiyappa, ,S. Kurungot, M. Sudip, R. Kothandaraman and Sukhendu Mandal, Multifunctional copper dimer: structure, band gap energy, catalysis, magnetism, oxygen reduction reaction and proton conductivity, *RSC advances*, 6(44), 37515-37521, **2016,** DOI: 10.1039/C6RA05961A;

21. K. Rajavelu, P. Rajakumar, M. Sudip, and R. Kothandaraman, Synthesis, photophysical, electrochemical, and DSSC application of novel donor–acceptor triazole bridged dendrimers with a triphenylamine core and benzoheterazole as a surface unit, *New J. Chem*., 40 (12), 10246-10258, **2016**, DOI: https://doi.org/10.1039/C6NJ02126C;

20. T. Thippani, M. Sudip, G. Wang, V. K. Ramani, and R. Kothandaraman, Probing oxygen reduction and oxygen evolution reactions on bifunctional non-precious metal catalysts for metal-air batteries, *RSC advances*, 6 (75), 71122-71133, **2016,** DOI: 10.1039/C6RA13414A;

19. M. P. Karthikayini, T. Thirupathi, G. Wang, V. K. Ramani, and R. Kothandaraman, Highly active and durable non-precious metal catalyst for the oxygen reduction reaction in acidic medium, *J. Electrochem. Soc*., 163(6), F539-F547, **2016**
DOI: https://doi.org/10.1149/2.1001606jes;

18. M. Veerababu, U. V. Varadaraju, and R. Kothandaraman, Improved electrochemical performance of lithium/sodium perylene-3, 4, 9, 10-tetracarboxylate as an anode material for secondary rechargeable batteries, *Int. J. Hydrog. Energy*, 40(43), 14925-14931, **2015**, DOI: https://doi.org/10.1016/j.ijhydene.2015.09.001;

17. K. M. Palanivelu, V. Prabhakaran, V. K. Ramani, and R. Kothandaraman, Controlling the nitrogen content of metal-nitrogen-carbon based non-precious-metal electrocatalysts via selenium addition, *J. Electrochem. Soc*., 162(6), F475- F482, **2015,** DOI: https://doi.org/10.1149/2.0101506jes;

16. V. Nallathambi, N. R. Leonard, R. Kothandaraman and S. C. Barton, Nitrogen precursor effects in iron-nitrogen-carbon oxygen reduction catalysts, *Electrochem. Solid-State Lett*., 14(6), B55, **2011**, DOI: https://doi.org/10.1149/1.3566065 ;

15. R. Kothandaraman, C. Bock, and Barry MacDougall, CH_3OH Oxidation Activities of an Unsupported PtxRuy Powder Catalyst before and after Different Electrochemical Treatments, *ECS Transactions* 28, 91**, 2010**, DOI: https://doi.org/10.1149/1.3505463;

14. R. Kothandaraman, V. Nallathambi, K. Artyushkova, and S. C. Barton, Non-precious oxygen reduction catalysts prepared by high-pressure pyrolysis for low-temperature fuel cells, *Applied Catalysis B: Environmental*, 92, 209-216, **2009,** DOI: https://doi.org/10.1016/j.apcatb.2009.07.005;

13. R. Kothandaraman, W. Deng, M. Sorkin, A. Kaufman, H. Frank Gibbard, and S. C, Barton, Methanol anode modified by semipermeable membrane for mixed-feed direct methanol fuel cells, *J. Electrochem. Society,* 155, B865, **2008,** DOI: https://doi.org/10.1149/1.2943212;

12. R. Kothandaraman and A. K. Shukla, A direct borohydride/hydrogen peroxide fuel cell with reduced alkali crossover, *Fuel Cells*, 7, no. 3, 225-231, **2007**, DOI: https://doi.org/10.1002/fuce.200600023;

11. R. Kothandaraman, S. K. Prashant, and A. K. Shukla, A 28-W portable direct borohydride–hydrogen peroxide fuel-cell stack, *J. Power Sources*, 162, 1073-1076, **2006**, DOI: https://doi.org/10.1016/j.jpowsour.2006.07.059;

10. R. Kothandaraman., A. K. Shukla, A. Gayen, M. S. Hegde, K. R. Priolkar, P. R. Sarode, and S. Emura, Tailoring a Pt–Ru catalyst for enhanced methanol electro-oxidation*, J. Power Source*s, 157, 45-55, **2006**, DOI: https://doi.org/10.1016/j.jpowsour.2005.06.031;

9. A. K. Shukla, R. Kothandaraman and K. Scott, Advances in mixed-reactant fuel cells*, Fuel cells*, 5, 436-447, **2005**, DOI: https://doi.org/10.1002/fuce.200400075;

8. NA Choudhury, RK Raman, S Sampath, AK Shukla, An alkaline direct borohydride fuel cell with hydrogen peroxide as oxidant, *J. Power Sources,* 143, 1-8, **2005,** DOI: https://doi.org/10.1016/j.jpowsour.2004.08.059;

7. R. Kothandaraman, and A. K. Shukla, Electro-reduction of hydrogen peroxide on iron tetramethoxy phenyl porphyrin and lead sulfate electrodes with application in direct borohydride fuel cells, *J. Applied Electrochem.* 11, 1157-1161, **2005**, DOI 10.1007/s10800-005-9021-y;

6. S. K. Mondal, R. Kothandaraman, A. K. Shukla, and N. Munichandraiah, Electrooxidation of ascorbic acid on polyaniline and its implications to fuel cells, *J. Power Sources*, 145, 16-20, **2005,** DOI: https://doi.org/10.1016/j.jpowsour.2005.01.001;

5. R. Kothandaraman, Nurul A. Choudhury, and Ashok K. Shukla, A high output voltage direct borohydride fuel cell, *Electrochem. Solid-State Lett.,* 7, A488, **2005**, DOI: https://doi.org/10.1149/1.1817855;

4. R. Kothandaraman, G. Murgia, and A. K. Shukla, A solid-polymer electrolyte direct methanol fuel cell with a methanol-tolerant cathode and its mathematical modelling, *J Appl. Electrochemistry,* 10, 1029-1038, **2004**, DOI: https://doi.org/10.1023/B:JACH.0000042674.78355.6c;

3. A. K. Shukla, R. Kothandaraman, N. A. Choudhury, K. R. Priolkar, P. R. Sarode, S. Emura, and R. Kumashiro, Carbon-supported Pt–Fe alloy as a methanol-resistant oxygen-reduction catalyst for direct methanol fuel cells, *J. Electroanal. Chem*., 563, 181-190, **2004,** DOI: https://doi.org/10.1016/j.jelechem.2003.09.010;

2. A. K. Shukla, and R. Kothandaraman, Methanol-resistant oxygen-reduction catalysts for direct methanol fuel cells, *Annu. Rev. Mater. Res.,* 33, 155-168, **2003**, DOI: https://doi.org/10.1146/annurev.matsci.33.072302.09351;

1. A. K. Shukla, C. L. Jackson, K. Scott, and R. Kothandaraman, An improved-performance liquid-feed solid-polymer-electrolyte direct methanol fuel cell operating at near-ambient conditions, *Electrochimica Acta*, 47, 3401-3407, **2002**, DOI: https://doi.org/10.1016/S0013-4686(02)00276-1;

Peer-Reviewed Publications: Reviews

1. Vimukthi Dananjaya1 Lei Ge, Nethmi Hansika, Venkata Chevali, John Bell, Satyanarayanan Seshadri, Pratheep Kumar Annamalai, Kothandaraman Ramanujam, Nisa Salim, Ashok Kumar Nanjundan, Advancing Energy Storage Technologies Beyond Lithium with Cellulose-Derived Sustainable Carbon Materials, ***Small Structures***, 2025; 0: e202500551
2. Daphne Mary John, Pratheep Kumar Annamalai, Alireza Hosseinmardi, Sreekanth Kaduvallil Mahadeva, Kothandaraman Ramanujam, Raghuram Chetty, Rajkumar Patel, Ramanujam Brahmadesam Thoopul Srinivasa Raghava, Ashok Kumar Nanjundan, Progress in Zinc oxide- based polymer nanocomposites for advancing piezoelectric energy harvesting and self-powered devices, *Macromolecular Materials and Engineering*, **2025,** ;0:e00239
3. Rubi Choudhary, Sangaraju Shanmugam, Kothandaraman Ramanujam, Bottlenecks and Techno-Economic Feasibility of the Zinc-Iodine Flow Battery, ***ACS Applied Energy Materials***, **2025**
4. Nandini Jaiswal, Harun Khan, Sangeeth John, Shubra Singh ,Antonio Tricoli, Borui Liu , Kothandaraman Ramanujam, Advances in boron-doped diamond electrodes: Fabrication, electrochemical properties, and applications, ***J. Alloys and Compounds***, 1036, **2025**, 181723
5. Muhammad Shoaib, Priya Vallayil, Nandini Jaiswal, Prathap Iyapazham, Sethuraman Sankaraeaman, Kothandaraman R*, and Venkataraman Thangadurai* for Advances in Redox Flow Batteries- A Comprehensive Review on Inorganic and organic Electrolytes and Engineering Perspectives, ***Advanced Energy Materials***,**2024**, 2400721
6. Nikhil G Mohanan, Kothandaraman R, Electrocatalysts for Ammonia Synthesis and How Close are We to the Haber-Bosch Synthesis? , Current Opinion in Electrochemistry, *Electrochemical Materials and Engineering*, 45, **2024**, 101520 **(invited article)**
7. A. Murali, M. Sakar, S. Priya, V. Vijayavarman, S. Pandey, Ryansu Sai,Y. Katayama,M. Abdul Kadera and R. Kothandaraman, Insights into the Emerging Alternative Polymer-based Electrolytes for All-Solid-State Lithium-ion Batteries: A Review, *Materials Letters*, 313, **2022**, 131764
8. Nandini Jaiswal, Harun Khan and Kothandaraman R, A review on the recent developments and challenges in the membrane-less soluble lead redox flow battery, *J. Electrochem. Soc*., 169, **2022**, 040543
9. A. K. Shukla, and R. Kothandaraman, Methanol-resistant oxygen-reduction catalysts for direct methanol fuel cells, *Annu. Rev. Mater. Res.,* 33, **2003**, 155-168. **(invited article)**

Journal Cover Pages Featuring our Work
1.Sonochemically synthesized hydride-stabilized boron nanosheets via radical-assisted oxidative exfoliation for energy storage applications, Anandhakumar Sukeri, Swati Panigrahi, and Kothandaraman Ramanujam, Chem. Comm., 2024, DOI: https://doi.org/10.1039/D3CC04342H 2.New cyclic and acyclic imidazole-based sensitizers for achieving highly efficient photoanodes for dye-sensitized solar cells by potential assisted method, S. Jagadeeswari, Indrapal Singh Aidhen, R. Kothandaraman, New J. Chemistry, 44, 10207-10219, 2020. DOI: https://doi.org/10.1039/D0NJ00137F 3.Redox-Active Copper-Benzotriazole Stacked Multiwalled Carbon Nanotubes for the Oxygen Reduction Reaction, Tamilselvi Gurusamy, Prakasam Gayathri, Sudip Mandal, Kothandaraman Ramanujam, ChemElectroChem, 5, 1837-1847, 2018. DOI:https://doi.org/10.1002/celc.201800110

Patents - Granted

S.No	Title	Synopsis	Patent No. /year
1	Composite membranes for aqueous redox flow batteries**,** Kothandaraman R, Harun Khan	The present invention relates to composite membranes for aqueous batteries. In particular, the invention pertains to composite membranes for redox flow batteries, comprising a hydrocarbon-based porous membrane and a cation-exchange polymer. A low-cost commercial hydrocarbon-based porous DARAMIC membrane has been utilised as the base framework and modified with a cation exchange polymer, namely sulfonated poly(ether ether ketone) (SPEEK), to simultaneously reduce the cost of vanadium redox	Indian Patent No. 571940/2025

		flow batteries (VRFBs) and enhance ion selectivity. The membranes of the present invention exhibit improved peak power density and discharge capacity as compared to the standard Nafion membrane, offering an economically viable solution for large-scale energy storage applications.	
2	A battery cell, Kothandaraman R, Harun Khan, Nandhini Jaiswal.	The present study introduces an innovative near-zero gap cell design to enhance the rate capabilities while operating at reduced flow rates by improving electrolyte mass transport to the electrode for soluble lead redox flow battery applications (SLRFB). This design involves replacing the 10-20 mm conventional thick flow frame with a thin (0.5 mm) porous separator, creating an almost zero-gap configuration between the electrodes. The proposed Multiholes Distributed Flow Cell Design (MFCD) significantly improves electrolyte distribution compared to conventional undivided flow cell design	Indian Patent No. 563374/2025

		(UFCD), enhancing mass transport. The substantial reduction in the inter-electrode gap leads to a marked decrease in ohmic drop. As a result, voltage efficiency (VE) and energy efficiency (EE) are improved by 7% and 9% at 20 mA cm^{-2}, respectively. Furthermore, the MFCD design withstands a current density of 100 mA cm^{-2}, whereas the UFCD design fails at 80 mA cm^{-2}. This innovative configuration can not only significantly reduce relative costs and flow rates but also enhance the overall performance of SLRFB systems.	
3	Metal oxynitride based photo-sensitive supercapacitor and photo supercapattery, Ramanujam, K.; Kandregula, G. R.; Naik, J.,	Low band gap chromium oxynitride was developed and used to convert oxygen into superoxide radicals in the presence of light. This superoxide and oxidized chromium oxy nitride combination develops a firm double layer in the presence of light and the double layer structure is retained even in dark conditions. This upon coupling with the zinc electrode leads to a	Indian Patent No. 556350/2024

		primary battery. Novelty: chromium oxy nitride replacing expensive precious metal based catalysts and cell able to get charged without use of electricity.	
4	Process for preparing functionalized and hydride inserted boron/borophene nanosheets, Kothandaraman Ramanujam, Anandhakumar Sukeri, Swati Panigrahi	By probe sonication, boron nanosheets were produced oxidizing boron powder with the hydrogen radicals produced by the homolytic cleavage of water. These boron nanosheets can be used for controlled reduction reaction in organic synthesis and as anode material for Li-ion battery	Indian Patent No. 554250/2024
5	High-capacity redox flow battery, Kothandaraman Ramanujam, Abhilipsa Sahoo	During charging 2,6-dihyroxanthraquinone undergoes reduction forming radical anion, which undergoes dimerization forming a peroxo species which is electro inactive upto 2.0 V, therefore high voltage cut-off of 2.4 V exercised to reduce dimer into dianion, allowing us to reach close to the theoretical capacity of the battery	Indian Patent No. 553775/2024
6	Electrode for soluble lead acid redox flow battery and soluble lead acid redox flow battery comprising the same, Kothandaraman R, M.S.Ramachandra Rao,	The present invention relates to an electrode for soluble lead acid redox flow battery (SLRFB), wherein the electrode comprises a boron-doped	Indian Patent No. 550716/ 2024

	Nandhini Jaiswal, Harun Khan, Nikhil C.	diamond (BDD) coated on a carbon substrate. This invention addresses critical challenges faced by soluble lead-acid redox flow batteries (SLRFBs). These challenges include lead dendrite formation at negative electrodes, incomplete dissolution of PbO2 deposits at positive electrodes, high overpotentials causing oxygen evolution during charging, carbon electrode corrosion, and limitations in cycle life and areal capacity.	
7	Electrochemical fixation and conversion of nitrogen into ammonia by $ZnMn_2O_4$ spinel derived from spent battery, Kothandaraman R and Tamilselvi G	$ZnMn_2O_4$ was synthesized using the recycled primary battery and demonstrated its utility to convert nitrogen to ammonia electrochemically	Indian Patent No. 502600 / 2024
8	Organic catholyte materials for aqueous organic flow battery, Kothandaraman R, Indrapal Singh Aidhen, Raja M, and Jagadeeswari S	Few quinone based redox active materials were developed and demonstrated as energy storage medium in flow battery	Indian Patent No. 493221 / 2024
9	A new multilayer sandwich design of a redox flow battery cell, Kothandaraman R and Varadaraju U V	To reduce iR drop (ohmic drop) a multilayer sandwich carbon material was developed for vanadium redox flow battery and reduced overpotential as much as 100 mV	Indian Patent No. 428259 / 2023
10	Solvent-filled multiwalled carbon nanotubes for	Polar solvents were filled into the multi walled	Indian Patent No. 400805 / 2022

	enhanced electrochemical sensing applications, Kothandaraman R and Tamilselvi G.	carbon nanotubes, which demonstrated an order of magnitude increased sensitivity towards simultaneous detection of biomolecules such as dopamine, uric acid, ascorbic acid etc.	
11	Method for improving vanadium redox flow battery performance by suppressing H_2 evolution and balancing redox kinetics using organic molecules, Kothandaraman R and Vasudevarao P	During charging, in the negative electrode of vanadium redox flow battery hydrogen evolves causing state of charge imbalance between the anolyte and catholyte. To prevent it, hydrogen evolution was mitigated using D-fructose	Indian Patent No. 404775 / 2022
12	Effect of semi - labile multidentate ligands on oxygen reduction reaction performance of non-precious metal catalysts, Kothandaraman R and Karthikayini M P	EDTA was used along with the Mn-based non-precious metal catalysts for oxygen reduction reaction. In the presence of EDTA oxygen reduction reaction activity enhanced.	Indian Patent No. 324235 / 2019
13	Novel catalyst for oxygen reduction reaction in fuel cells, SAC Barton, R. Kothandaraman, V. Nallathambi	A iron-based non-precious metal catalysts was generated and demonstrated for oxygen reduction reaction in fuel cells	US Patent No. US20110287174A1 / 2011

Patents - Submitted

S.No.	Title	Synopsis	Application No. /year
1.	Gamma radiation-based charging in Zinc-polyiodide flow battery	The present invention relates to a radiation mediated charging of a redox flow battery system, more particular to a gamma	Appl.No. 202541076918/2025

		radiation-based charging in Zinc-polyiodide redox flow battery (ZIFB), and further to a method of non - electrical charging of the catholyte using gamma radiation in ZIFB.	
2.	A Smart Metallic Self-Healing Composite Coating and a Method of Preparation Thereof. Lakshman N, Kothandaraman R, Durgambika V, Yoganandan, G	A Smart Metallic Self-Healing Composite Coating and a Method of Preparation Thereof.	Appl.No. 202541070953/2025
3.	Process for preparing Tin Coated High Performance Gas Diffusion Electrode (GDE), Kothandaraman R, Ramanathan S, Anoop N	A novel three step method to fabricate a stable tin-based gas diffusion electrode (Sn-GDE) for electrochemical CO_2 reduction to formate. The electrode operates at up to 500 mA/cm^2 with >70% formate selectivity and shows >120 h stability (Formate selectivity >75 %) at 100 mA/cm^2, with an integrated reactivation protocol to restore performance.	Appl. No. 202441096498/2024
4.	THF-Water Solvent Mixture with New Electrolyte Composition for Enhancing Iodine Solubility in Zinc-Polyiodide Redox Flow Batteries, Kothandaraman R, Indrapal Singh Aidhen, Rubi	A THF-water cosolvent is employed to enhance the solubility of I_2 in Zinc-polyiodide redox flow batteries, leading to improved electrolyte utilization and, consequently, a reduction in the overall cost of ZIFB.	Appl. No. 202541022785/2025

5.	Enhancing Solubility of Bromine in Energy-Dense Zinc-Bromine Flow Batteries Through Low-Cost Electrolyte Additive, Kothandaraman R, Nivedha. L.K	NaBr as an economical additive is incorporated to improve bromine solubility in the aqueous electrolyte of zinc-bromine flow batteries. Bromine is retained as polybromide in the solution phase thereby reducing the vapour pressure of bromine and attaining a high volumetric capacity.	Indian Patent filing, Year: 2025, IDF No 3286
6.	Low-cost Octa-Vinyl POSS/SPEEK Blend membrane for vanadium redox flow battery, Kothandaraman R, Priyanka Bavdane, Dr. Gaurav Pande, Vansh Bhutani, Aneena Simon	The membrane reported herein is made up of low-cost materials which can reduce the overall cost of redox flow batteries. SPEEK polymer is blended with OV-POSS and improves its selectivity toward vanadium ions thereby, achieved comparable performance with Nafion® 117. Therefore, this invention provides a new strategy for cost reduction of flow batteries.	Indian Patent filing, Year: 2025, IDF No 3305
7.	Donnan Potential Countering the water movement making membrane perm selective to K^+ ions in Zinc-polyiodide redox flow batteries, Kothandaraman R, Harun Khan, Rubi	In the zinc-polyiodide redox flow battery, the thicker Nafion membrane is replaced with a bilayer membrane composed of a porous and a thinner 25 µm Nafion membrane. However, the low-cost electrolyte additive KCl is incorporated to mitigate electrolyte crossover.	Appl. No. 202441051658/2024
8.	Probe Sonication Converting Nitrates to Ammonia in	Nitrates were converted into ammonia using hydrogen	Appl. No. 202341087398 /2023

	water, Kothandaraman Ramanujam, Nikil George Mohan	radicals obtained through the homolytic cleavage of water by ultrasonication.	
9.	Boosting the coulombic and energy efficiencies along with rate capability of SLRFB by using a BDD coated carbon felt electrode, Kothandaraman Ramanujam, Ramachandrarao M.S, Harun Khan, Nikhil C, Nandini Jaiswal	Boron-doped diamond (BDD)coating was done on the carbon felt electrode making it corrosion resistant at high voltage operation in aqueous electrolytes. The use of BDD coated demonstrated utilizing it as positive electrode in the soluble lead redox flow battery enhancing the voltage, capacity and energy efficiency of the battery	Appl. No. 202341057222 / 2023
10.	Catholyte material for aqueous acidic flow battery, Vivekananda Mahanta, Richa Gupta, and Kothandaraman R,	A three electron reduction process was established using dopamine hydrobromide salt, which is utilized as catholyte in the zinc-organic catholyte flow battery	Appl. No. 202241042107/2022, IDF NO. 2384.
11.	Molecular and electrode engineering of pentacene-5,7,12,14-tetraone for sustainable organic aqueous zn-ion batteries, Kothandaraman R, Veerababu M, Chinamay R	A novel, ordered mesoporous carbon (CMK-3) was used to host the pentacene-tetraone enhancing the C-rate (charging rate) of the battery.	Indian Patent Filing Year: 2019, IDF NO. 1945)

Research Grants - Sponsored

S. No.	Title	Sponsoring Agency / Aims of Grant	Period	PI/Co-PI	Amount ~ (Rupees in lakhs)
1	Non-flammable aqueous zinc-bromine battery: AI-based molecular design, synthesis, and	DGIST, South Korea/ Finding electrolyte membranes for the	2024-2026	PI	26

	characterization of polymer MOF-composite porous membrane	zinc bromine flow battery			
2	Development of boron-doped diamond coated corrosion-resistant carbon fabric for energy, and textile/organic effluent water cleaning applications	National Technical Textiles Mission, Ministry of Textiles / For Developing BDD coated carbon felt, carbon paper to demonstrate corrosion resistance of cathode in fuel cells and flow batteries	2023-2026	PI	702
3	1kW/5kWh Redox Flow Battery with Anthraquinone Based Anolyte and Iron Catholyte: A Commercial Worthy India-Centric Solution for Grid-Scale Energy Storage	DST-TDP / For the synthesis of kg scale 2,6-dihydroxy anthraquinone for demonstrating cost-reduction methodologies and utilizing it for kW scale flow battery building with industry support	2023-2025	PI	230
4	Renewable Ammonia Fuel for Circular Energy Economy- A Carbon Free Approach	Energy Consortium-IIT Madras / Demonstrating ammonia reactor using the 2D materials developed in this project	Jul 2023-Jan 2025	PI	46
5	Boron-doped diamond based electrolysis: Giving a second life to industrial waste water	Mobility Grant To U. Sydney by IIT Madras / To collaborate with Prof Antonio Tricoli from U. Sydney on BDD	Mar 2023-Mar 2025	PI	7

		coated electrodes for water treatment			
6	Soluble Lead Redox Flow Battery	ARCI-Hyderabad / To demonstrate kW scale soluble lead redox flow battery with the additives and modified carbon felt electrodes developed in our lab	April 2023-Oct 2024	PI	15
7	Activation of zinc and exploring the catalytic amount of zinc for cycloaddition reaction	Pfizer Healthcare India Private Limited / Demonstrated recovery of zinc from the spent solution by electrochemical plating process	Jan 2023-July 2023	Co-PI (50% share)	38.16
8	Development of 1 kW/10 kWh Zinc-Bromine Redox Flow Battery	Archean Chemical Industries Limited / For demonstrating 5kW gel redox battery using novel corrosion free zinc substrate	2023-2024	PI	109
9	Energy Storage and Conversion Vertical of The Energy Consortium IIT Madras	MHRD-IITM / For developing quasi solid state electrolyte for Li-S and Li-ion batteries	2023-2025	Co-PI	1500 (300 is for advanced energy storage and conversion vertical)
10	Spent Battery Recycling into Electrocatalyst for Ammonia Production and Raw Materials for New Batteries	Department of Science and Technology / Demonstration of Zinc-air battery and ammonia production using $ZnMn_2O_4$	29 Sep 2021 to 28 Sep 2024	PI	77.93

		extracted from the spent battery.			
11	Advanced Centre for Energy Storage and Conversion (PCoE)	Ministry of Human Resource and Development / For Li-S battery development	04 Feb 2021 to Feb 2025	PI	225 250 (March 2023-March 2025)
12	Meso-microporous core-shell carbon-based materials and electroactive diluent for long cycle life and high energy density Li- S batteries	Indian Space Research Organization / For developing mesoporous ordered carbon material host for Sulfur loading. This is utilized as cathode in Li-S battery	29 Oct 2020 to 28 Oct 2022	PI	24.99
13	Tailoring of quinones as high energy density cathode materials for sustainable secondary aqueous Zn-ion batteries	Indian Institute of Technology Madras / Developed organic cathode materials for rechargeable Zn-ion battery	4 Jan 2020 to 23 Jan 2021		6.10
14	On the Reduction of iR-Iosses, Flow Optimization and Identifying Alternative Membranes to Nafion for 1kW -4kWh Vanadium Redox Flow Battery Suitable for Residential Use	Ministry of Human Resource and Development / Developed novel thin carbon electrodes for reducing iR loss at kW scale redox flow battery	2 Years (30 Dec 2019 to 29 Dec 2022)		99.89
15	Energy Storage Platform on Supercapacitors	Department of Science & Technology / Developed cathode materials for Li/Na battery and organic	5 Years (06 Nov 2019 to 05 Nov 2024)		95.62

		redox active materials for flow battery			
16	Light induced process of hierarchical electron cascade system, materials and devices for solar energy conversion	Science and Engineering Research Board	14 Nov 2018 to 13 Mar 2022	Administrator for the NPDF grant	10.00
17	Development of High Performance and Low-Cost Boron-Doped Diamond Electrodes for Waste Water Treatment	Impacting Research Innovation and Technology – IMPRINT / Served as consultant for analysing the waste water treated by novel boron-doped diamond electrode based cell	09 Dec 2019 to 08 Dec 2022	Co-PI (20% share)	142.78
18	Ionogel Electrolyte Membrane Fuel Cell with Plasma Electrolytic Nitrided Metallic Bipolar Plate and Effective Flow Field Design	Department of Science & Technology / Developed catalyst for the oxygen reduction reaction	02 Sep 2019 to 01 Sep 2022	Co-PI (33% Share)	56.73
19	Investigation of Stable Organic and Organometallic Radical Ions and Ions as Electro-active Species in Organic Redox Flow Batteries (RFBs) in Non-aqueous Media	Science and Engineering Research Board / Developed phenazine, pyrylium platforms, benzyl viologen based redox molecules for flow battery	24 Sep 2018 to 24 Feb 2022	Co-PI (50% share)	75.59
20	DST Solar Energy Harnessing Centre - Energy Storage Domain - Sub Project	Department of Science & Technology / Modifications of the	28 Jun 2018 to 30 Jun 2022	Co-PI (50% share)	293.70

		electrode and electrolyte for vanadium redox flwo battery to improve energy efficiency and capacity			
21	DST Solar Energy Harnessing Centre - PV Domain (RWP-PartA) - Sub Project Role: PI	Department of Science & Technology / Developed cyclic and acyclic imidazole, carbazole, triphenylamine based dyes for dye sensitized solar cells	3 years (28 Jun 2018 to 30 Jun 2022)	Co-PI (share ~ 1.5 Cr)	559.14
22	Development of 10 kW / 50 kWh Redox Flow Battery System for Solar PV Applications	Impacting Research Innovation and Technology – IMPRINT	16 Feb 2017 to 31 Mar 2022	Co-PI (20% share)	399.84
23	Development and Demonstration of 250W, 1kWh Vanadium Redox Flow Battery Systems Rechargeable by Renewable Energy such as Solar and Wind Energy	Department of Science & Technology / Demonstrated 250 W flow battery stack and operated using solar power	3 Years (17 May 2017 to 16 Aug 2020)	PI	81.37
24	Direct light to chemical energy conversion: A hybrid of solar cell and battery	Indian Institute of Technology Madras	1 Year (01 May 2016 to 30 Jun 2017)	PI	7.00
25	Rechargeable zinc-air battery with novel 3D zinc electrode structure and durable bipolar cathode	Council of Scientific and Industrial Research	01 Jan 2015 to 31 Dec 2016	PI	3.00

26	Polynuclear transition metal complexes for electrochemical reduction of oxygen	Department of Science & Technology / Developed Mn, Fe and Co based non-precious metal catalyst for fuel cell	14 Aug 2014 to 13 Aug 2017	PI	25.00
27	Non-precious metal catalyst for oxygen reduction reaction in Polymer Electrolyte Membrane Fuel Cells (PEMFC) with improved durability and activity	Indian Space Research Organization / Developed non-precious metal catalysts for oxygen reduction reaction	26 Sep 2011 to 25 Sep 2014	PI	31.40
28	Non-precious metal catalysts with increased active catalytic-site density for the electrochemical oxygen reduction reaction	Nissan Research Support Program	06 Jul 2011 to 05 Jul 2013	PI	8.80
29	Exploding type metal precursors for the synthesis of a non-precious metal catalyst with improved oxygen reduction activity	Indian Institute of Technology Madras	05 Jul 2011 to 04 Aug 2013)	PI	20.70

Research Grants – Consultancy (Kothandaraman is the PI in all the projects listed below)

S.No.	Title	Sponsoring Agency	Period	Amount ~ (Rupees in lakhs)
1	1kW/5kWh Redox Flow Battery with Anthraquinone Based Anolyte and Iron Catholyte: A Commercial Worthy India-Centric Solution for Grid-Scale Energy Storage	LeeP eDrive Pvt. Ltd.	2024-2026	10 (Industry partner of DST project S.No. 2 in the **Research Grants – Sponsored Table above**)

2	Strategies towards the development of 10 kW/ 50 kWh Vanadium redox flow batteries for commercial applications	OECT (ONGC)	Jan 2024 – June 2025	829
3	Electrolyte Evaluation	D. J. Irvin Company LLC	4 months (Mar – Jun 2023)	4
4	Patent Licensing (Indian Patent Filing Year: 2022, IDF NO. 2384)	Archean Chemical Industries Limited	2023	50 + 2% Royalty
5	Development of an efficient organic magnesiumborate-based (OMBB) electrolyte compatible with ordered mesoporous carbon (OMC) based sulfur cathode material for Mg-S battery technology	Tumpudi Innovations Private Limited	July 2023 – July 2024	32.34
6	Exploration on use of Efficient Phenazine Based Molecules as Redox-Active Materialin Redox Flow Battery (RFB) system, in both domain of Aqueous Organic RFB (AORFB) & NonAqueous RFB (NORFB) for Industrial Application.	NOCIL Limited	3 months (01 Oct 2022-31 Dec 2022)	5.46
7	Design, Development and Demonstration of 10 kWh/1kW Rechargeable Energy Storage System in Combination with Solar PV Charging: Vanadium Redox Flow Batteries (RBIC project)	ONGC Energy Centre Limited	2 Years (16 Aug 2019 to 15 June 2022)	388 (Completed)
8	Removal of Cl- from the sodium formate + sodium	Amber Chemicals and Pharmaceutical	6 months (01 Jun 2021 to 30 Nov 2021)	5.31

	chloride solution (RBIC project)	s Private Limited		
9	Development of High Performance and Low-Cost Boron-Doped Diamond Electrodes for Waste Water Treatment	Kapindra Precision Engineering Private Limited	2 Years (18th May 2020 to 08th Dec 2022)	3.0
10	Converting spent zinc-carbon and zinc based alkaline batteries into a source of nutrients in the manure	Tide Water Oil Company (India) Limited	3 Years (23 Mar 2020 to 22 Mar 2023)	20.82
11	Carbon materials development for battery	Labkarts	3 months (22 Mar 2021 to 21 Jun 2021)	2.00
12	Fuel cell reactor for H_2O_2 production	Research Supporters India	1 Year (01 Jul 2019 to 31 Dec 2019)	1.50
13	Development of oxygen sensor and gas purification system	Elixir Electronics	1 Year (04 Feb 2019 to 29 Feb 2020)	1.18
14	Specific Power Consumption of $KClO_3$ plant	Vaighai chemical industries limited	1 Year (01 May 2018 to 13 Oct 2018)	0.59
15	Colouring Project	Titan Company Ltd.	1 Year (01 Feb 2017 to 31 Dec 2017)	9.38
16	Novel method of directly converting rice husks (RH) to carbon-encapsulated, Nano-structured silicon (cnSi) for Li-ion Battery (LiB) Anodes	Maccaferri Environmental Solutions Private Limited	1 Year (01 Mar 2014 to 30 Sep 2015)	3.60

Invited talks and lectures	
1.	Title: Inside the Layered Lattice: Structure-Property Rules for Next Gen Li-ion Cathodes, 62nd Annual Convention of Chemists and the International Conference

	on Chemical Sciences for Net Zero Goals and Sustainability, Madras Christian College, Chennai, 18-20th December
2.	Title: Reinforcing a Lithium-ion Battery Cathode (NCA) with Mn Doping, 12th National Conference on "Recent Trends in Materials Science and Technology-2025", Indian Institute of Space Science and Technology, Trivandrum, 19th December, 2025
3.	Title: Inside the Layered Lattice: Structure-Property Rules for Next Gen Li-ion Cathodes, 3rd International Conference on Nanoscience and Nanotechnology, VIT Vellore, 16-19th December 2025
4.	Title: Towards Practical Zn/I2 flow Battery, International Meeting of the Battery Research Society, Bengaluru, 6 – 9th December, 2025
5.	Title: Decoding Mn incorporation in NCA cathodes using multi-scale characterisations CeNS-Bengaluru, 10th November, 2025
6.	Title: Decoding Mn incorporation in NCA cathodes using multi-scale characterisations SMC-Chennai Chapter Inauguration and Workshop at IIT Madras on 1st November 2025.
7.	Title: High-Capacity Redox Flow Battery- Zn/I_2 3rd International Conference on Smart Devices and Sustainable Energy, Ming Chi University of Technology, Taiwan between 15th -17th October,2025
8.	Title: Electro-basics of batteries and characterization. Renewable Energy and Storage Workshop/Symposium, Hatflied Campus, University of Pretoria, South Africa between 1st - 3rd October,2025
9.	Title: Reinforcing Li-ion battery cathodes with Mn doping of NCA battery National Symposium on Electrochemical Science and Technology (NSEST-2025)", at SRMIST, Kattankulathur on 28 & 29th August, 2025
10.	Endowment Lecture Title: *The breathing lattices:* Alkali metal insertion and deinsertion in solid-state energy reservoirs. Inauguration of chemical society and Dr.S.V. Anantakrishnan endowment lecture at Anderson Hall, Madras Christian College, Department of Chemistry on August 25 2025.
11.	Title: Vanadium Redox Flow Battery Research using COMSOL Multiphysics COMSOL day Chennai, held at Radisson Blu Hotel, Chennai City Centre, July 18, 2025
12.	Title: Polymer Electrolytes for Aqueous Redox Flow Battery Polymer Society Conference at Jeju Convention Centre, Korea, April 17, 2025
13.	Title: High-Capacity Aqueous Redox Flow Batteries, DGIST-Deagu, April 15,2025

14.	Title: High- Capacity Redox Flow Batteries Yonsei University, Seoul, April 14, 2025
15.	Title: High- Capacity Safer Aqueous Flow Batteries 5th International Conference on Emerging Smart Materials in Applied Chemistry (ESMAC-2024) & 2nd KIIT-CRSI Seminar on Modern Trends in Chemical Sciences in Collaboration with The National Academy of Sciences, India (NASI) Local Chapter, India between December 20-22, 2024
16.	Title: High- Capacity Aqueous Redox Flow Batteries Energy Summit 2024, held at Deakin University, Melbourne, Australia between 26-29 November 2024.
17.	Title: Boron doped diamond coated graphite felt electrodes as corrosion free positive electrodes for energy storage systems. 30th International Conference & Expo on Corrosion held at Chennai Trade Centre, India between November 20-23,2024
18.	Keynote Lecture Title: Lithium Storage Capacity of van der Waals Gap in the Alternatives to Graphite, 4th International Conference on Advanced Materials Synthesis, Characterisation and Applications held at Queensland University of Technology (QUIT), Brisbane, Australia, between September 25-27,2024.
19.	Title: Post Lithium Storage Envisioned with Aqueous Flow Batteries. International Conference on Frontiers in Electrochemistry: Innovations in Supercapacitors and Batteries held at Crescent Institute of Science and Technology, Chennai, between September 20-21,2024.
20.	Title: Post Lithium Storage Envisioned with Aqueous Flow Batteries. 3rd International Conference on Electrochemical Science and Technology-2024 held at CSIR-NPL, New Delhi, between September 18-20,2024.
21.	Title: Lithium Storage Capability of Van der Waals Gap in the Alternatives to Graphite. The 13th Bengaluru INDIA NANO 2024, organized by Department of Science & Technology, Government of Karnataka, Karnataka Science & Technology Promotion Society (KSTePS), and Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) held at The Lalit, Bengaluru between August 1-3,2024
22.	Title: Faradaic and Non-Faradaic Contribution to the Capacity of Novel Organic Cathode of Li-ion Battery. International Conference on Energy and Environmental Materials (E2M-2024), organized by Department of Metallurgical Engineering and Materials Science, Indian Institute of Technology Indore between July 11 – 13, 2024

23.	Title: Lead an expert session on Microbial Electrochemical Technologies-Fundamentals and characterization tools. DST –SERB (Karyashala) workshop jointly organized by KSCSTE-CWRDM, Thiruvananthapuram, Kerala between July 5-11, 2024
24.	Title: Novel high voltage cathode, anode materials, and polymer electrolyte for Li-ion battery applications. SERB workshop on Advanced Energy Storage Materials and Device Fabrication organized at University of Calicut, Malapuram between May 27-31, 2024
25.	Title: Lithium metal/Lithium-ion Polymer Electrolyte Batteries. Asian Conference on Electrochemical Power Sources 12 (ACEPS-12), Osaka-Japan between May 19-22, 2024
26.	Plenary Lecture Title: Hydrogen Storage via Ammonia by Electrochemical Reduction of Nitrogen SERB Workshop on Green Hydrogen Production, Storage and Transportation: A Green Energy Prospective, School of Mechanical Engineering, VIT, Vellore between March 14-15 2024
27.	Title: One Redox Centre with Three Hats Post Lithium Storage Cluster of Excellence (POLIS), Online Seminar organized by Dr Johannes Schnaidt, Universitat Ulm, Germany, 28th February 2024
28.	Title: One Redox Centre with Three Hats 18th Asian Conference on Solid State Ionics (ACSSI)-2024 organized at Meenakshi College for Women on 22nd February 2024
29.	Title: One Redox Centre with Three Hats **International Conference on Advanced Functional Materials and Devices – 2024**, organised by SRM University, Chennai between 26-28th February 2024
30.	Title: Organic Redox Flow Battery Chemistries and Capacity Drop Mitigation Strategies Current Trends in Chemical Sciences organised by CRSI Madhurai Chapter at School of Chemistry, Madurai Kamaraj University between Feb 21 to 23, 2024.
31.	Title: Upending Current Ammonia Synthesis Method International Conference on Electrochemistry for Industry, Health and Environment (EIHE-2024), VIT Vellore, 8th February 2024
32.	Title: High Energy and Power Density Redox Flow Battery Chemistries for Grid Storage Indo-German Centre for Sustainability (IGCS) Summar School 2023, The Integration of Renewable Energies into a Power Grid – A Key Contribution towards a Carbon Neutral Society, organized by TU Berlin, Germany and IIT Madras, India July 24 - August 4, 2023.
33.	Memorial Lecture Title: Electrochemistry on Storing Energy and Building Molecules

	Dr K S Rajagopalan Birth Centenary Memorial Lecture, Ramakrishna Mission Vivekananda College, Mylapore, Chennai, on 11th October 2023
34.	Title: Electro valorisation DAE-BRNS 6th National Workshop on Materials Chemistry (NWMC), BARC, Mumbai, 13-14, October, 2023 (Bronze Medal Lecture)
35.	Title: In-situ Regeneration of Energy Delivery in an Organic Redox Flow Battery 30th CRSI National Symposium in Chemistry (CRSI-NSC-30) organized by Jawaharlal Nehru University, New Delhi from February 3-5, 2023. (Bronze Medal Lecture)
36.	Title: Commercial Worthy Redox Flow Battery Chemistries Indo-French Workshop on Clean and Sustainable Energy Technologies (INFINITE), National Physical Laboratory-Delhi, 21-24, February, 2023
37.	Title: Long Duration Energy Storage Systems for India (Including Pumped Hydro) Stationary Energy Storage India, Organized by IESA at Hotel Metropolitan-New Delhi, 17th February 2023
38.	International Conference on "Future of Energy with Science and Technology" (FEST 2022) organized by Department of Chemistry, University of Delhi, New Delhi from December 29-30, 2022.
39.	Title: 1-2-1 Pathway: Electrically Refurbishing Organic Redox Couples for Energy Storage in Flow Battery IC-ECS-2023, Amrita Vishwa Vidyapeetham, Coimbatore, 23rd June 2023
40.	Title: Two's Company or Crowd? The importance of being single for energy delivery Recent Advancements in Sustainable Electrochemical Processes (RASEP2023), TKM College of Engineering, Kollam, TEQIP II Sponsored Faculty Development Program, 9-10th January 2023
41.	Title: DRT Analysis of Lithium Sulfur Batteries Wiley InfoMat Workshop in India: Current Status and Future Potential of Energy Technologies, on June 24th, 2022
42.	International Conference on "Recent Trends in Materials and Magnetism (RTMM-22)" organized by the Department of Chemistry, Loyola College (Autonomous), Chennai - 600034 from December 15-16, 2022.
43.	National Convention of Electrochemist (NCE) held at PSG Tech, Coimbatore between 26th to 27th July 2022
44.	Symposium entitled "Chemistry and Materials for New Batteries Technology" organized by Canadian Chemistry Conference and Exhibition (CCCE 2022) to be held from June 13th – 17th, 2022, in Calgary
45.	"Low-dimensional materials-2022" organized by IISER-Pune from 19th -20th May 2022

46.	Amara Raja Award Lecture at the National Symposium on Electrochemical Science and Technology (NSEST-2021) organised by Electrochemical Society of India at Inorganic Physical Chemistry-IISc-Bangalore.
47.	Title: Sustainable Materials for Energy Storage Seminar Venue: National Centre for Nanoscience and Nanotechnology, University of Madras, Chennai, 16th March 2020 (this seminar is organized by the Director of National Centre for Nanoscience and Nanotechnology, the University of Madras for the postgraduate students)
48.	Title: Catalysis on the surface of nanotubes having confined solvent media Conference details: Asian Consortium for Computational Materials Science: International Conference on Materials Genome (ICMG-2020), SRM University, Amaravathi, 5-7th February 2020
49.	Title: Solvent Filled Multiwalled Carbon Nanotubes for Sensor and Battery Applications Conference details: Electrochemistry in Industry Health and Environment, BARC, Mumbai, 21-25th January 2020 (organized by Indian Society for Electroanalytical Chemistry)
50.	Title: Ultra high energy efficient redox flow battery, Conference details: Frontiers in Materials Processing Applications, Research and Technology (FiMPART, Endorsed by Materials Research Society Singapore), Convention Centre, Ahmedabad, 15-17th December 2019.
51.	Title: Low Field ^{1}H NMR Investigations of Solvent Filled Multiwalled Carbon Nanotubes for Sensor and Battery Applications Symposium details: Solid State and Structural Chemistry Unit, Alumni Symposium 2019, Indian Institute of Science, Bangalore, 13th December 2019.
52.	Title: Beyond Vanadium Redox Flow Battery: India Specific Solutions for Energy Storage Invited lecture details: Chemical Engineering seminar, Indian Institute of Technology Kanpur, 06th November 2019
53.	Title: Tuning overpotential and electrolyte structure to realize high energy efficient redox flow battery Conference details: International Conference on Recent Trends in Chemistry of Materials (NCRTCM-2019), Bannari Amman Institute of Technology, Sathyamangalam, 12th October 2019
54.	Title: Materials for Electrochemical Applications Faculty development program details: STC on 2D Materials, ICSR Hall 3, Indian Institute of Technology Madras, Chennai, 23rd September 2019

55.	Title: Tuning overpotential and electrolyte structure to realize high energy efficient redox flow battery Conference details: Recent Advances in Materials Science for Sustainable Development-2019 (RAMSSD-2019), VFSTR (Deemed to University), 1st September 2019
56.	Title: Enhanced Electrochemical Sensing of Endohedral Carbon Nanotubes, Symposium details: Chemistry in-House Symposium (CiHs), Indian Institute of Technology Madras, Chennai, 21st August 2019
57.	Title: A New Process for Quick Fabrication of Dye-Sensitized Solar Cells Invited lecture details: SSN College, Kalavakkam, Chennai, 16th March 2019
58.	Title: Strategic Partnership with IIT Madras and Joint Workshop Indian Institute of Technology Madras, Chennai 11-13th July 2018
59.	Title: Modification of Graphite Felt Electrodes for Vanadium Redox Flow Battery Application Workshop details: Indo-German Joint Scientific Workshop on Membranes for Water and Energy, CSIR- Central Salt and Marine Chemicals Research Institute (CSMCRI), 18th -20th February 2019
60.	Title: Recent Developments in Redox Flow Battery Chemistry Conference details: Advanced Nanomaterials for Energy, Environment and Healthcare Applications (ANEH – 2019), Bishop Heber College, Trichy, 05th February 2019
61.	Title: Stable Radical Ion Based Redox Flow Battery Seminar details: ChEMS Seminar, Chemical Engineering and Materials Science, Michigan State University, 15-16th October 2018
62.	Title: Metal-air batteries Seminar details: HP Green R&D Centre, Bangalore, 9th March 2018
63.	Title: Our Recent Experience with Redox Flow Batteries Invited lecture details: CSIR-CECRI (Council of Scientific & Industrial Research - Central Electrochemical Research Institute), Karaikudi, 20th September 2018
64.	Title: Organic Materials for Energy Science: DFT Guided Molecular Engineering Approach Materials Design and Energy Materials: Computational Approach Seminar details: SRM Institute of Science and Technology, Chennai, 5th February 2018
65.	Title: Synthetic and Bio-derived Nanostructures for Selective Sensing of Biotinyl Targets Symposium details: Symposium on Materials in Chemistry & Biology, Indian Institute of Technology Gandhinagar, Gujarat, 5th January 2018.

66.	Title: Metal Organic Framework and Organic Framework Built on Carbon Nanotubes by π-π Interaction for Electrochemical Applications Conference details: CEAMCR-2018, DAE Convention Centre, Anushaktinagar, Mumbai, 15-17th February-2018
67.	Title: A Strategy of Enhancing the Surface Plasmon Assisted Light Harvesting in Dye Sensitized Solar Cells Conference details, National Convention of Electrochemist (NCE-19), National Institute of Technology –Trichy, 28 - 29th March 2016
68.	Title: Non-precious metal catalysts for fuel cell application Conference details: INDO-US ECM-2013, Banaras Hindu University, Varanasi, 26 -28th February 2013
69.	Title: Non-precious metal catalyst developed by freeze-dry method Conference details: Recent Advances in Electrochemical Energy Materials and Devices, Indian Institute of Science (IISc) Bangalore, 24-25th July 2012

ECS-IITM Student Chapter Mentoring for Outreach Activities

As a faculty advisor of the ECS-IITM student chapter organized and conducted several outreach activities. They are listed below.

(i) ECS-IITM Student Chapter Inaugural Event and Workshop – December 10, 2022.

(ii) A study tour was organized for student chapter members and IIT M.Sc students on December 30, 2022. Students visited the International Advanced Research Centre for Powder Metallurgy and New Materials at IITM Research Park to understand fuel cell making.

(iii) Conducted the fastest finger quiz competition alongside a three-day international conference on energy conversion and storage (IECS-2023) between January 18-20, 2023.

(iv) ECS-IITM Student Chapter along with SRM University, conducted a two-day workshop on "Electrochemical Techniques for Next Generation Batteries" with hands-on activities on batteries and supercapacitors. Conducted quiz competition as part of the workshop.

(v) Organized eminent lecture series through the ECS-IITM student chapter. The first speaker of this series was Prof. Werner Paulus from the University of Montpellier, France, on April 19, 2023.

(vi) Conducted a workshop on "Biosensors and Electroanalytical Techniques" on June 27, 2023, with Prof. Sadagopan Krishnan, Oklahoma State University, USA. Conducted hands-on finite/infinite diffusion experiments with

impedance and rotating disk electrodes and electrochemical sensing of dopamine.

(vii) Organized a lecture by Prof K Vidyasagar on "Structural correlations of nonmolecular solid-state energy materials" on September 5, 2023, as part of Teacher's Day celebrations

(viii) Conducted an Indo-Korean workshop at Terrace Hall between September 20-21, 2023. Performed hands-on sessions with zinc-bromine battery, fuel cells, electrochemical impedance spectroscopy, rate constant calculations using Tafel slop, and the making of reference electrodes.

(ix) A workshop on Electro Sustainability conducted on December 5, 2023, as part of the Energy Summit 2023 conference.

(x) A workshop on "Symmetry Elements and Structure Solving" by Prof Werner Paulus, U. Montpellier between 12 to 16th Jan at IIT Madras

(xi) Organized guest lecture on "Low-T oxygen diffusion questioning long-range oxygen, electronic and domain ordering in non-stoichiometric Transition Metal Oxides" through the ECS-IITM student chapter. The speaker of this series was Prof. Werner Paulus from the University of Montpellier, France, on January 17, 2024

(xii) A Workshop on "Electrochemical Characterization of Batteries" conducted at NIT Trichy Campus on January 22nd and 23rd 2024.

(xiii) A Symposium and workshop on "Batteries" conducted on 23rd and 24th February to felicitate Prof A K Shukla (IISc Bangalore) for his seminal contributions to the electrochemistry. The plenary speakers are Prof. Werner Weppner (University of Kiel, Editor of Ionics) and Prof. V Thangadurai (U. Calgary, Associate Editor of ACS Applied Materials & Interfaces and J. Materials Chem. A). Besides, many invited speakers from across the country graced the occasion.

(xiv) A workshop on "Computational Electrochemistry- Fundamentals and applications" which highlights the basic principles and applications of DFT was conducted at IIT Madras on July 8th and 9th 2024.

(xv) Two days workshop on "Prospectus for Li-ion batteries and Emerging Electrochemical Energy systems" was conducted in collaboration with PSG Institute of Advanced Studies, Coimbatore and Biologic Science Instruments at PSG Institute of Advanced Studies, Coimbatore on July 29th and 30th 2024.

(xvi) Organized lectures by Prof. S. Sankararaman and Prof. Parasuraman Selvam on September 5, 2024, as part of Teacher's Day celebrations.

(xvii) Two days workshop on powering the future: Innovations in Lithium-ion Battery Technology was conducted in collaboration with Metrohm India Pvt Ltd, at Centre for Research, Bannari Amman Institute of Technology, Sathyamangalam, Tamil Nadu

(xviii) Three days hands-on training workshop on characterization of electrified interfaces in batteries and supercapacitors, organized at Vellore Institute of Technology, Tamil Nadu between November 13- 15 2024.

(xix) Two days interactive workshop on electrochemical technologies: Emphasizing Batteries, Supercapacitors, and Fuel cells, organized at Vellore Institute of Technology, Tamil Nadu between December 5- 6 2024.

(xx) Indo-Korea Workshop on Batteries and flow batteries, organized at IIT Madras on January 30, 2025

(xxi) Two days workshop on Electrochemical Energy Systems: From Fundamentals to Fabrication (A skill development Program) Battery Technology was conducted in collaboration with Centre for Advanced Materials Research Innovation and Technology, Department of Physics and Electronics, CHRIST University, Bengaluru between March 7-8 2025.

(xxii) Hands-on Session on Fabrication and Characterization of VRFB, Electrolysers and Fuel cells, Cell fabrication and Electrical Characterization of Zn-Ion batteries in collaboration with Small Sciences Symposium by IITM, held between June 11-12 2025, IIT Madras

(xxiii) Organized lectures by Prof. Sangaraju Shanmugam on July 21 2025, on Flow batteries

(xxiv) Organized lectures by Dr. Shrisudersan on August 07 2025, on "Supercapacitors; From material inventions to product development"

(xxv) Organized a preconference workshop at ICSTEE 2025, PSGIAS, Coimbatore

News on our Activity in Magazines:

ECS News & newsletters – Coverage of IIT Madras ECS Student Chapter activities and awards (2023–2025).

- https://www.electrochem.org/ecsnews/tag/ecs-chapters-of-excellence/
- https://92bf4c7f-630d-4eed-93d95b7f44edb047.filesusr.com/ugd/304cb8_7e71e7c79e864954a8468b6f4949fed9.pdf
- https://92bf4c7f-630d-4eed-93d9-5b7f44edb047.filesusr.com/ugd/304cb8_8a1a5d24710047259c2e56f5bcbc0ea4.pdf
- https://92bf4c7f-630d-4eed-93d9-5b7f44edb047.filesusr.com/ugd/304cb8_b6891d93fe9e4576bc4e4bca9a255666.pdf
- https://92bf4c7f-630d-4eed-93d9-5b7f44edb047.filesusr.com/ugd/304cb8_f73f1e4c26e54c24ae0b6385fc52e4f5.pdf

News about our research

- https://tech-talk.iitm.ac.in/a-new-class-of-battery/
- *https://twitter.com/iitmadras/status/1631195298872840192?t=S36XIIWYi5nddJsp7n3AKw&s=08*
- https://www.thehindubusinessline.com/business-tech/iit-m-scientists-develop-improved-flow-battery-technology/article66847902.ece

- https://www.thehindubusinessline.com/business-tech/ammonia-from-used-batteries/article36929429.ece
- https://www.thehindubusinessline.com/business-tech/putting-rooftop-solar-to-many-good-uses/article64577772.ece
- https://www.pressreader.com/india/the-hindu-business-line/20220425/281956021344451
- https://www.iastoppers.com/articles/can-flow-batteries-support-india-s-renewable-energy-pivot
- https://techindiaexpress.in/can-flow-batteries-support-indias-renewable-energy-pivot/

Technology Contribution

- Developed a standalone 10kW/0.1MWh Vanadium Redox Flow Battery, in partnership with High Energy Batteries (I) Ltd. Trichy and with OECT (ONGC energy centre trust), VRFB for EV charging station.

A photograph of 10kW/0.1MWh system developed with HEB for ONGC-Energy Trust Centre

- Developed 10kWh/1.4 kW Vanadium Redox Flow Battery Energy Storage System, which is under field trial at High Energy Batteries (I) Ltd. Trichy. The technology is transferred to ONGC.
- Catholyte ($DABr_3$.HBr with AQDS Anode) Material for Aqueous Acidic Flow Battery, Indian Patent Application No. :202241042107. **Kothandaraman R** and Vivekandanda M

Above IP licensed to *Archean Chemical Industries Limited for 50 Lakhs + 2% Royalty.* Technology transfer ceremony can be viewed at: ***https://twitter.com/iitmadras/status/1631195298872840192?t=S36XIIWYi5nddJsp7n3AKw&s=08***

- Jointly Developing 10kWh Indigeneous Zinc-Bromine Redox Flow Battery with Archean Chemical Industries Limited.

- Our Technology for Repurposing Waste Battery Materials into Battery Electrodes Won Third Prize in New Generation Ideation Contest 2022 Conducted by Hindustan Petroleum Corporation Limited.

Standalone 5kW/10kWh flow battery stack (Developed with ONGC funding with industry partner High Energy Batteries I Ltd.) charging two wheeler show cased in Indi Energy Week held in Goa between 6th-9th February 2024

NPDF Projects and Other Grant Details of Our Group

S.No.	Title of the Project/ Agency	Amount (Rs. In lakhs)	Scholar Name	Start date	Duration
1.	Women Leading IITM 2024 / IITM	2.1	Ms.Sravani Potham	April 2024 to September 2024	6 months
2.	Women Leading IITM 2024 / IITM	2.1	Mrs. Priya.V	April 2024 to September 2024	6 months
3.	Women Leading IITM 2024 /IITM	1.05	Ms. Richa Gupta	April 2024 to June 2024	3 months

4.	Rational Design and Development of Large-Area Perovskite Solar Cells / (SERB-TARE Fellowship)	10.05	Dr. G Murugadoss	14-10-2022	3 Years (ongoing)
5.	Borophene: A novel two-dimensional graphene-like material for future energy storage applications / (SERB-NPDF)	22.37	Dr. Anandhakumar Sukeri	01-03-2022	2 years
6.	Women Leading Innovation 2022 / IITM	2.1	Dr. Sumana B	01-03-2022	2 years
7.	Light induced process of Hierarchical electron cascade system, Materials and Devices for Solar energy conversion / (Teachers Associateship For Research Excellence-TARE)	10.05	Dr. M. Asha Jhonsi	14-11-2018	3 Years
8.	Enhanced photovoltaic performances of dye-sensitized solar cells sensitized with triphenylamine/phenothiazine-oxindole/dithienobenzotriazole based dyes / SERB-NPDF	17.02	Dr. Selvam (NPDF)	21-06-2017	2 Years
9.	Permselective membrane and polymer/garnet electrolyte for Li-S batteries / SERB-NPDF	19.2	Dr. M. Raja	21-09-2017	2 Years
10	Electroorganic Modifications of Graphene into Redox-mediator-cum-Substrate to Immobilize Glucose	19.2	Dr. P. Gayathri	08-06-2016	2 Years

	Oxidase/Cholesterol Oxidase for Bio-sensor Applications / SERB-NPDF				

Whereabouts of PhD Students Graduated

S. No	Name of the scholar	Title of the thesis	Current affiliation	Year of graduation
1	Dr. M. P Karthikayini	Metal-nitrogen-carbon (MNC) based non-precious metal catalysts for electrochemical reduction of oxygen in fuel cells	Chemist (Group B Gazetted Officer), Department of Industries and Commerce, Government of Tamil Nadu, Guindy, Chennai	2016
2	Dr. Anjaiah Sheelam	Metal-organic complexes and carbon materials derived from metal-organic complexes for oxygen reduction reaction in alkaline medium	Assistant Professor, NIT Warangal	2017
3	Dr. T. Thirupathi	Cobalt and nitrogen doped carbon materials for rechargeable zinc-air battery and carbon supported g-C_3N_4 for hydrazine sensor applications	Manager, Renewable energy systems limited, Hyderabad	2017
4	Dr. M. Veerababu (Co-guided)	Studies on certain aromatic diimides and conjugated carboxylates as electrode materials for secondary lithium/sodium-ion battery applications	Scientist of Energy Technology Division, Godi India Pt. Ltd, Hyderabad	2017
5	Dr. Rakesh Verma (Co-guided)	Ternary Transition Metal Oxides and Sulphides as New Anode Materials for Rechargeable Alkali Metal Ion (Lithium and Sodium) Battery Applications	Assistant Professor, Central University of Allahabad- Uttar Pradesh 211002	2017

6	Dr. P Vasudeva Rao	Studies on new electroactive fluids and catalysts for redox flow batteries and membrane less fuel cells	Manager, R&D Li-ion Battery Technology, Amara Raja Batteries Limited, Hyderabad, Telangana	2018
7	Dr. Sudip Mandal	Molecular Engineering for Dye-Sensitized Solar Cells and Chemo sensors: An Experimental and Computational Approach	Assistant Professor (Senior Level), Division of Chemistry, Department of Sciences and Humanities, Vignan's Foundation for Science, Technology and Research (Deemed to be University), Guntur, Andhra Pradesh	2019
8	Dr. Divya Unny	Carbazole, phenothiazine and triphenylamine based organic dyes with different push-pull architecture for dye-sensitized solar cells	-	2022
9	Dr. Ramavath Janraj Naik	Boosting the energy density of aqueous supercapacitor through the multitude of approaches and development of eco-benign membrane/binder materials	Assistant Professor ,Sri Venkateswara College, Delhi University	2022
10	Dr. Tamil Selvi G.	Electrochemical sensors and electrocatalytic production of ammonia.	Postdoctoral scholar at The University of Texas at Austin, USA	2022
11	Dr.M. R. Chinmaya	Tweaking the redox-active organic material properties and electrode engineering for rechargeable battery applications	Postdoc (AvH Fellow) at Ulm University, Germany	2022
12	Dr.Yashwant Pratap Kharwar	Nickel and Copper-based electrocatalysts and nitrogen-doped carbon support for platinum	Postdoc at IIT Bombay	2022

		nanoparticles for the oxygen reduction reaction in the energy conversion systems		
13	Dr.Sumana B	Activated carbon-based electrode materials with iodine/iodide redox-active ionic liquid and solid-state electrolyte for the supercapacitor applications	Postdoc at Brunel University London	2022
14	Dr.Dipsikha Ganguly	Development of electrode materials and technique for efficient energy storage and conversion devices	Volt14 Solutions, Singapore	2023
15	Dr.Vivekananda Mahanta	Electrode Engineering for Vanadium and Exploring Endurance of Alternative Redox-Active Materials for Aqueous Acidic Redox Flow Battery	Postdoctoral scholar, ULB Brussels	2023
16	Dr. Kandregula Ganapathi Rao	Studies on light sensitive devices and aqueous asymmetric supercapacitors	Assistant manager at Amararaja batteries	2023
17	Dr. Harun Khan	Vanadium and Organic redox flow batteries	Head of energy storage and battery research-ARKLE Energy Solutions	2024
18	Dr. Priya V	Zn-ion batteries and organic redox flow batteries	Assistant Professor at University of Calicut	2024
19	Dr. Sravani Potham	Supercapacitors	Associate Scientist at GODI India Pvt Ltd.	2024
20	Dr. Richa Gupta	Zn-ion batteries	-	2024
21	Dr. Sandeep Mohapatra	Organic redox flow batteries	-	2025
22	Dr. Nivedha L. K.	Zinc-Air batteries	Scientist, Archean Chemicals	2025

Current PhD Students

S. No.	Roll No./Name	Tentative title/ Area of research	Status	Expected Year of Completion
1	CY20D045/ Mohana Priya	Li-ion batteries	6th Year	2025
2	CY20D049/Swati Panigrahi	Li-ion batteries and electrochemical reduction of nitrogen	6thYear	2025
3	CH20D021/Anoop N	Electrochemical CO_2 reduction	5th Year	2025
4	CY21D048/ Nikhil G Mohan	Electrochemical reduction of nitrogen and theoretical work	5thYear	2026
5	CY21D074/ Abhilipsa Sahoo	Aqueous organic redox flow batteries	5thYear	2026
6	Megha Bala/ CY22D053	Lead flow batteries	4thYear	2027
7	Rubi/ CY22D013	Zn-Iodine flow batteries	4th Year	2027
8	Santhoshini/CY23D038	Na-ion batteries	3rd Year	2028
9	Mathru Naik/CY23D099	Li ion batteries	3rd Year	2029
10	Sripadha Shekhar/CY24D060	Electrochemical reduction of nitrogen	2nd Year	2029
11	Manavi/CY24D061	Zn-ion batteries	2nd Year	2029
12	Vansh Butani/CY24D062	Na- ion batteries	2nd Year	2029
13	Shakthi/CY24D059	Li ion batteries	2nd Year	2029
14	Aneena simon/CY24D058	Redox flow batteries	2nd Year	2029
15	Joel Baskar/CY24D065	Li ion batteries	2nd Year	2029
16	Sandeep Kumar/ CY24D021	Li-S batteries	2nd Year	2029
17	Sundaravalli / CY24D106	Flow Batteries	1st Year	2029

18	Deeksha Varshney/ CY25D001	Electro-organic synthesis	1st Year	2030
19	Kathir/ CY25D075	Li-ion batteries	1st Year	2030

Notable Achievements of my Students	
Name / Roll. No.	**Achievement**
Dr. Richa Gupta	Professor Ramamurthy Award for the best Ph.D. Thesis in Chemistry for the academic year 2024 – 2025
Dr. Priya V	Institute Research Award – 2023 (it carries a cash prize of Rs 20,000 and a citation from IIT Madras) for her outstanding PhD work
Dr Vivekananda Mahanta	Best Thesis Award 2023 - Langmuir Prize
Dr. Kandregula Ganapathi Rao	Institute Research Award – 2022 (it carries a cash prize of Rs 20,000 and a citation from IIT Madras) for his outstanding PhD work Professor Ramamurthy Award for the best Ph.D. Thesis in Chemistry for the academic year 2023 – 2024
Dr. Dipsikha Ganguly	Keshav Rangnath Excellence in Research Award (it carries a cash prize of Rs 20,000 and a citation from IIT Madras) for her outstanding PhD work
Dr. Chinmay Mirle	Presented a oral presentation on invitation in Junior National Organic Chemistry Symposium (JNOST-22), School of Chemistry, University of Hyderabad, held between Jan 06-09, 2022 Best Ph.D thesis award in 2022
Dr. Sumana Brahma	Young Scientist award in the 40th Annual Conference Indian Council of Chemists, Hyderabad (Dec 2021)
Dr. Tamil Selvi G.	• DST Selected her to attend 13th HOPE Meeting (Meeting of Nobel Laureates) organized by the Japan Society for the Promotion of Science in March 2022 for her outstanding research work. She is one among 9 chosen for this honour. Young researchers selected from various countries to engage

	in interdisciplinary discussions with Nobel laureates and other distinguished scientists. ● Institute Research Award - 2020 ● Society of Materials Chemistry (BARC) Emerging Scientist Award-2024
Dr. Jagadeeswari S	● SERB-NPDF poster competition award -2020 by DST-SERB ● Best young women award by Genesis of Educational Impressions -2021
Ms. Vanshika Jain	Best M.Sc thesis award in 2018