CECRI NEWS

(A monthly newsletter of CSIR-CECRI)

January 2025 Vol. 6 Iss. 1

International Symposium on Advances in Electrochemical Science and Technology

Since its inception in 1964, the Society for Advancement of Electrochemical Science and Technology (**SAEST**), a vibrant professional body of electrochemists and electrochemical engineers, has brought together the academic and industrial communities to exchange ideas, disseminate knowledge on electrochemical science and technology especially by arranging national and international conferences regularly in collaboration with CSIR-Central Electrochemical Research Institute (**CSIR-CECRI**), Karaikudi. The International Symposium on Advances in Electrochemical Science and Technology (**iSAEST**) has been its flagship event and the Thirteenth Edition of iSAEST (**iSAEST-13**) was organized by SAEST at Uday Samudra Leisure Beach Hotel Kovalam, Thiruvananthapuram, Kerala, India during January 8-10, 2025 in collaboration with CSIR-CECRI, Karaikudi and CSIR-National Institute of Interdisciplinary Science and Technology (**CSIR-NIIST**), Thiruvananthapuram, Kerala.

सीएसआईआर-सीईसीआरआई
CSIR-CECRI
CSIR-CENTRAL ELECTROCHEMICAL RESEARCH INSTITUTE
Your Destination for Innovative Research

INSIDE THIS ISSUE

The **iSAEST-13** attracted nearly 600 delegates including 30 international delegates representing various Industrial/academic/research institutions participated in this symposium. Commercial exhibition with a display of electrochemical products, processes and analytical instruments of electrochemical techniques and characterization were arranged. Domain experts and global leaders in various fields of advancement in electrochemical science and technology delivered special lectures during the event. More than 200 papers were presented in seven theme focused technical sessions that included Electrochemical Power Sources, Electrocatalysis & Electrochemical Sensors, Electroplating and Metallurgy, Coatings & Corrosion. A dedicated Research Scholars' Session consisting of oral and poster presentations was organized and the best oral and poster presentations were encouraged with cash awards with certificates.

Earlier, a **Pre-conference Workshop** on ***Materials and Electrochemical Methods for Energy Systems*** involving hands-on training program was conducted on January 7, 2025 by **Prof. Jean Marie Tarascon**, Collège de France, France, **Prof. Vijayamohanan K. Pillai**, Dean-Research and Development, IISER, Tirupati and **Prof. S. Sampath**, Department of Inorganic and Physical Chemistry, IISc, Bengaluru. The technical talks on designing electrolytes and additives for Li-ion batteries, *in situ* techniques to probe electrochemical interfaces and limitations of cyclic voltammetry (Do's and Don'ts) added flavor to the technical sessions. Nearly 175 student delegates participated and got benefitted through this conference.

The Inaugural function of iSAEST-13 was held on January 8, 2025 wherein **Prof. Vijayamohanan K. Pillai,** President, SAEST welcomed the gathering and explained the essentiality of iSAEST-13 for interaction between Research Scholars, Eminent Electrochemists, Young & Experienced Faculty Members, and Industry Experts. **Dr. G.A. Pathanjali**, Organizing Committee Chairman briefed on the activities scheduled during iSAEST-13.

Dr. K. Ramesha, Director, CSIR-CECRI in his felicitation address emphasized the importance of international conference like iSAEST-13, and the growing technological demands of the society and the economic targets set by governments. **Dr. C. Anandharamakrishnan**, Director, CSIR-NIIST expressed on the crucial role of electrochemistry in mitigating carbon emissions through developing electric vehicles of various compositions.

The iSAEST-13 was inaugurated by the Chief Guest **Dr. N. Kalaiselvi**, Secretary, DSIR & Director General, CSIR by releasing the Souvenir. In her inaugural address, Dr. N. Kalaiselvi emphasized the role of electrochemistry in Energy, Environment and Strategic Securities. She highlighted the CSIR's contribution to the nation and its commitments for making this country a self-reliant in energy sector. She honoured the **Michael Faraday Medal Lecture** Awardee, **Prof. Arumugam Manthiram**, University of Texas at Austin, USA with a gold medal and a citation. She also honoured the newly initiated **SAEST-Allen J. Bard Memorial Lecture** Awardee, **Prof. Jean Marie Tarascon** with a silver medal and a citation.

Prof. Arumugam Manthiram narrated the global scenario on the electrochemical energy storage systems, market potentials and progress in fundamental research on various advanced battery chemistries for future demands. **Dr. M. Sathish**, Principal Scientist and Secretary, SAEST proposed the vote of thanks for the inauguration session. Later, the commercial exhibition was inaugurated by DG, CSIR and Director, CSIR-CECRI presided over the function.

Technical Sessions conducted on three days included 44 oral presentations, 220 poster presentations, 4 keynote lectures and 40 invited talks by experts from academia and industries across the globe. Leading oil companies like IOCL, ONGC and GAIL, premier academic institutions like IISc, IITs, IISERs and NITs apart from Universities and CSIR network of research organizations took part actively through their research team leaders and budding scientists.

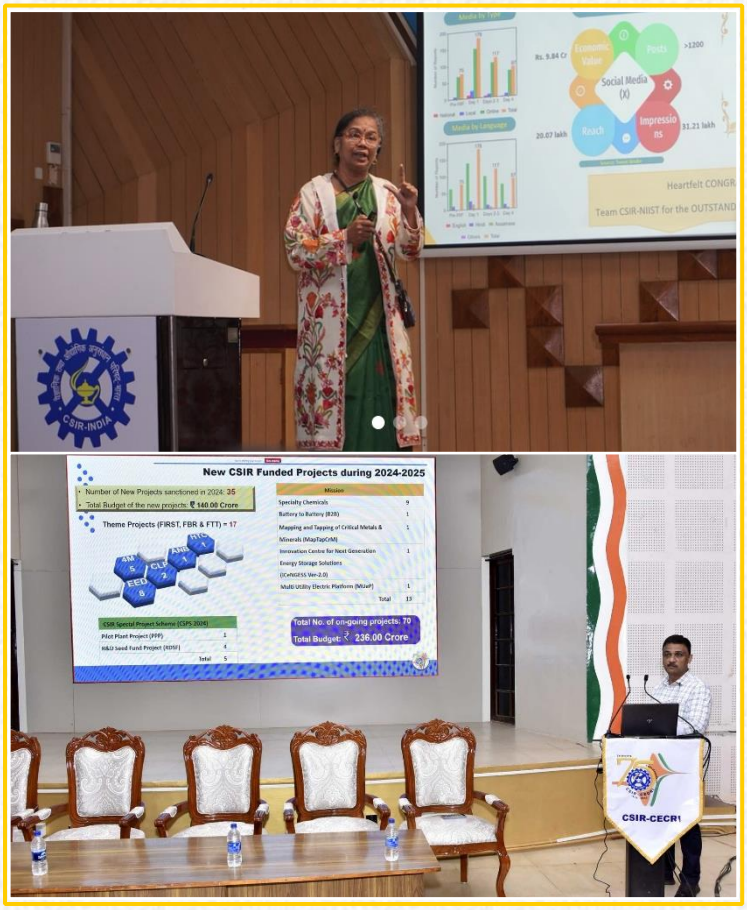
Quite different from the conventional electrochemical conferences, benefitting the academicians and researchers on fundamental and theoretical aspects in a major way, this ISAEST-13 dealt in depth the recent advancement in electrochemical techniques and technologies, societal applications of electrochemical processes by involving more industries and industry-institution collaborative research teams. Professors and Industry Researchers from countries like USA, UK, Germany, Australia, Singapore, South Korea and Asia Pacific presented their research progress and involved in technical interactions.

An exclusive technological exhibition of more than 50 stalls showcasing the products of electrochemical and scientific instrument makers as well as specialty chemicals used in the R&D of electrochemical science and technology was also arranged during iSAEST-13. Cultural events by Natyasala Kathakali Sangham added colour to the symposium.

Towards the end of the iSAEST-13, Valedictory function was held where **Prof. Chandrabhas Narayana**, Director Rajiv Gandhi Centre for Biotechnology, Thiruvananthapuram graced as the Chief Guest and delivered the valedictory address on January 10, 2025. **Dr. A.S. Prakash**, Vice-President, SAEST welcomed the gathering and **Dr. M. Sathish**, Secretary, SAEST summarized the entire iSAEST-13 proceedings. **Dr. K. Ramesha**, Director, CSIR-CECRI and **Dr. C. Anandharamakrishnan**, Director, CSIR-NIIST offered the felicitations. **Dr. G. A. Pathanjali**, Managing Director, High-Energy Batteries, Mathur, Tamil Nadu delivered the Presidential Address.

Best oral and poster presentations awards were chosen by a committee of experts, and were awarded with cash prizes and merit certificates. The event supporters/ sponsors were recognized by a memento, as a token of appreciation for the support extended. The iSAEST-13 came to a conclusion with a Vote of Thanks by **Dr. S.T. Nishanthi**, Joint Secretary, SAEST.

New Year Address

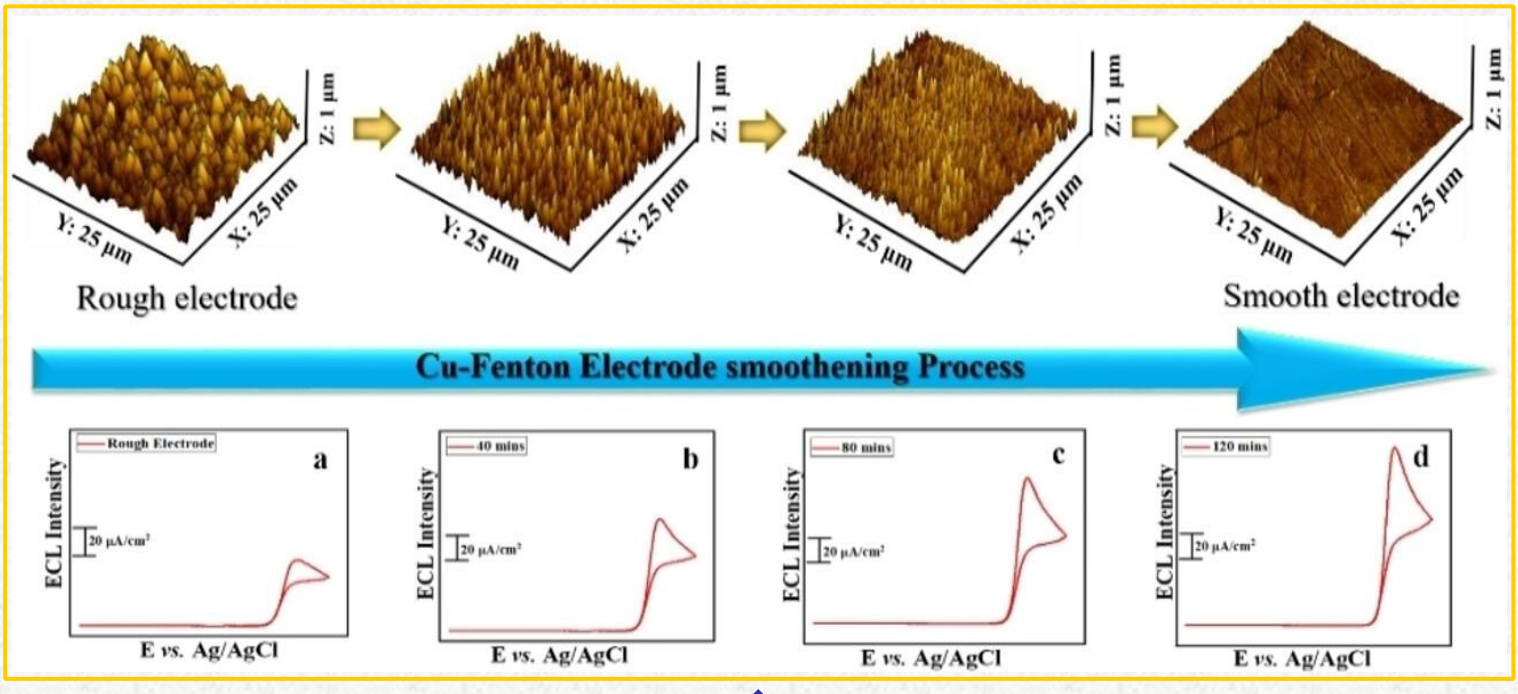


Dr. N. Kalaiselvi, Secretary, DSIR and DG-CSIR addressed all the members of the DSIR, CSIR, NRDC and CEL on January 1, 2025 on the occasion of New Year 2025. She wished all the participants a very happy and prosperous new year and went on to present in detail the progress made in 2024 and the path ahead beginning 2025. Dr. Kalaiselvi expressed her delight on the achievements of CSIR in 2024 and propounded the path for glory in 2025. She made a clarion call to the CSIR family in dedicating themselves in efforts ensuring realization of our Hon'ble PM's vision of Viksit Bharat 2047.

Later, **Dr. K. Ramesha**, Director, CSIR-CECRI addressed the CSIR-CECRI fraternity on the accomplishments of the Institute in 2024, the ongoing R&D activities and the future R&D road map. He commended the contributions of each and every member of the CSIR-CECRI fraternity towards the cause of the Institute in 2024 and solicited more such support in 2025 as well. He underscored the key takeaways from DG-CSIR's address to achieve the institutional targets & organizational goals. The requisite R&D infrastructure, manpower, financial input, work place, etc. have been strengthened and spruced up for a conducive environment for enhanced output, he added.

High Impact Publication

- A Research Article by **Dr. S. Senthil Kumar** et al., Electrodics and Electrocatalysis Division, CSIR-CECRI has been published in **Angewandte Chemie Int. Ed.** 64 (2025) e202421185 -
  Enhanced Electrochemiluminescence by Knocking Out Gold Active Sites
  K.S. Indhu Leka, Laurent Bouffier, Neso Sojic and S. Senthil Kumar
  https://doi.org/10.1002/anie.202421185



Honours and Awards

Mr. Kamaha Tchekep Armand Gutemberg, DBT-TWAS Fellow (Guide: Dr. Deepak Pattanayak, Electrochemical Process Engineering Division, CSIR-CECRI) has won the Best Presentation Award at the **International Conference on Electrochemistry for Industry, Health & Environment (EIHE-2025)** organized by the Indian Society for Electroanalytical Chemistry, Bhabha Atomic Research Centre, Mumbai during January 21-25, 2025.

The following scholars of CSIR-CECRI won Oral/Poster Presentation Awards at the **13th International Symposium on Advances in Electrochemical Science and Technology** organized by SAEST at Thiruvananthapuram [January 8-10, 2025]:

Mr. N. K. Murugasenapathi, AcSIR Scholar
(Guide: Dr. P. Tamilarasan, Electrodics and Electrocatalysis Division)
- Oral Presentation on *Expanding the Frontiers of Operando Electrochemical Analysis by In Situ Raman Spectroscopy.*

Mr. A. Vasantha Gangadharappa, AcSIR Scholar
(Guide: Dr. A.S. Prakash, CSIR-CECRI Chennai Unit)
- Poster Presentation on *Enhanced stability and suppressed intermediate phase transition by doping Mg in to O3 type cathode material.*

Ms. Shubhi Tripathi, AcSIR Scholar
(Guide: Dr. S. Vengatesan, Electrochemical Process Engineering Division)
- Poster Presentation on *Design of capillary-fed Cell Where Capillary Action Meets Electrolysis to Generate Hydrogen.*

Mr. S. Hariramakrishnan, AcSIR Scholar
(Guide: Dr. P. Tamilarasan, Electrodics and Electrocatalysis Division)
- Poster Presentation on *Development of a High-Sensitivity Co-Ni MOF/rGO Composite Chemiresistor for Selective Detection of Hazardous Gases.*

Business Development Leads

- FTT020511 - Collaborator's Progress Meeting [Jan 2]
- Meeting with M/s. IEC Fabchem Ltd. [Jan 3]
- CLAIM Project Proposal Review Meeting [Jan 10, 11]
- MNRE Expert Committee Meeting [Jan 17]
- Meeting with M/s. Group Surya [Jan 21, 22]
- GAP 18/22 ASEAN MS Collaborators Meeting [Jan 23]
- MNRE Project Proposal Meeting [Jan 24]
- H2T Mission Project - Review Meeting [Jan 2, 13, 28]
- Meeting with M/s. Vimla Engineering [Jan 29]
- Meeting on Lead Acid Battery Testing [Jan 31]

Yusuf Hamied Chemistry Camp

CSIR-CECRI and **Royal Society of Chemistry**, India Section jointly organized the **Yusuf Hamied Chemistry Camp** under the banner of CSIR-Jigyasa for 9th Std. students of Govt. Schools in Tamil Nadu [74 students from 32 schools] during January 22-24, 2025. **Dr. N. Lakshminarasimhan**, and **Dr. P. Tamilarasan** delivered science awareness lectures. A quiz programme and career guidance event was conducted by AcSIR Scholars. The camp comprised of experiments like: crystallization, color creation, slime, forensic challenge, clock reaction and global coin battery experiment. The Expert from RSC, **Ms. Melissa Mendonza,** coordinated all the camp activities.

CFE and AcSIR Highlights

- DAC-III Meeting for Ms. K.A. Esther Jebakumari, AcSIR Scholar (Guide: Dr. P. Tamilarasan) [Jan 2]
- DAC-III Meeting for Ms. M. Aswathi, AcSIR Scholar (Guide: Dr. V. Ganesh) [Jan 3]
- PhD Viva Voce examination for Mr. Krishnendu Bera, AcSIR Scholar - Thesis Title: *Development of Non-precious Transition Metal based Electrocatalysts for Water Splitting Application* (Guide: Dr. Subrata Kundu) [Jan 13]
- PhD Viva Voce examination for Mr. S.K. Das, AcSIR Scholar - Thesis Title: *Studies on Heteroatom and Fe, Co, Ni based Oxygen Reduction Catalyst for Polymer Electrolyte Fuel Cells* (Guide: Dr. A.K. Sahu) [Jan 13]
- Meeting of CFE Faculty Members [Jan 20, 31]
- Online Meeting for AICTE Approval to B.Tech. Admission [Jan 21]
- Orientation Lecture for PhD Scholars [Jan 23]
- PhD Viva Voce examination for Ms. N. Mohanapriya, AcSIR Scholar - Thesis Title: *Imine as Constructional Units for Organic-Inorganic Hybrid Structures for Energy Applications* (Guide: C. Naveen Kumar) [Jan 24]
- Meeting of the Students Academics Committee [Jan 27]
- Synopsis Submission of Ms. C. Jesica Anjeline, AcSIR Scholar (Guide: Dr. N. Lakshminarasimhan) [Jan 30]
- Synopsis Submission of Ms. Shikha Thapa, AcSIR Scholar (Guide: Dr. A.K. Sahu) [Jan 30]
- Synopsis Submission of Ms. K.M. Lakshmi, AcSIR Scholar (Guide: Dr. C. Jeyabharathi) [Jan 31]

Skill Development Activities

- A five-day Industry Oriented Refresher Training was conducted on ***Lithium-ion battery: Materials to Manufacturing*** during January 20-24, 2025. This programme was attended by 13 Industrial participants from all over India [viz., DRDO DIBER, Haldwani-2, EEE Energy Pvt. Ltd., Krishnagiri-2, Renault Nissan Technology & Business Centre India, Chennai-2, Flyon Batteries, Palakkad-2, CSIR NPL, New Delhi-1, CSIR CECRI, Karaikudi-1, Sai Delta Inspection & Testing Laboratory, Chennai-1, Self-Sponsor-2].
- A five-day Skill Development Training Programme was conducted on ***Photolithography based Microfabrication of Sensors*** during January 27-31, 2025. A total of 31 participants from all over Tamil Nadu got trained in this programme.

Official Events

- iSAEST-13: Organizing Committee Meeting [Jan 1]
- iSAEST-13: Technical Committee Meeting [Jan 2]
- Training for Apprentice [Jan 2, 3, 10, 17, 30]
- CSIR ISTAD-ISTAG Meeting [Jan 3]
- Prioritization Committee Meeting [Jan 21]
- Online Workshop on ACCESS Application [Jan 23]
- Normalization Committee Meeting [Jan 23]
- Safety Committee Meeting [Jan 27]
- RC Follow-up Meeting [Jan 29]
- Viswa Hindi Diwas Celebration [Jan 30]
- Meeting of the Patent Committee [Jan 30]
- Laboratory Strategic Group Meeting [Jan 30]

SSBMT Outdoor Zonal Winners

The **Cricket and Volleyball Teams of CSIR-CECRI** participated in the 52nd Shanti Swarup Bhatnagar Memorial Tournament (**SSBMT**) - Outdoor Zonals at CSIR-Centre for Cellular & Molecular Biology (**CSIR-CCMB**), Hyderabad during January 17-19, 2025 and emerged as **Zonal Winners**. As a result, the teams got qualified for the Finals scheduled at CSIR-Institute of Himalayan Bioresource Technology (**CSIR-IHBT**), Palampur, Himachal Pradesh during February 7-10, 2025. Dr. K. Ramesha, Director, CSIR-CECRI and President, CSIR-CECRI Club felicitated the players and wished them all the best for the Finals.

Snapshots

76th Republic Day Celebration

Yusuf Hamied Chemistry Camp

Lab Visit during Skill Development Programme

ASEAN Collaborators Meeting

Viswa Hindi Diwas Celebration

Pongal Festival Celebrations by AcSIR Scholars

Farewell and Felicitation to the Retirees

CECRI NEWS

January 2025 Vol. 6 Iss. 1

TECHNOLOGY COMPENDIUM OF CSIR-CECRI

- Indigenous Li-ion battery
- Indigenous Sodium Ion Battery
- Performance Improved Lead Acid Battery
- CO_2 capture under flue gas conditions
- Integrated Corrosion Monitoring Sensor Gadget accessible through a Mobile App
- Thermal Barrier Coatings for Strategic Applications
- Electrochemical Production of Sodium Hypochlorite as a Disinfectant (against COVID-19)
- Tri-layered reusable face mask with antibacterial coating
- Polymer Electrolyte Membrane (PEM) fuel cell
- Triboluminescent Coating and Smart Camera for Crack Detection in Structural Components
- Electrochemical Defluoridation of Drinking Water
- Solar Powered Proton Exchange Membrane (PEM) Based Water Electrolyser for Hydrogen Generation
- Cement-Polymer Composite Coating System for Corrosion Protection of Reinforcing and Prestressing Steels
- Solid Lubricant Coatings for Brahmos Missile Application
- Li Spheres for Torpedo Applications
- Electrowinning and Recovery of Tin from Primary Ore and Secondary Sources
- Electroplating of Gold, Copper and Nickel, Chromium, Zinc-Nickel Alloy; Anodizing of Aluminium; Electropolishing of Stainless Steel
- Electro-catalytic Conversion of CO_2 and butadiene to Adipic Acid; CO_2 to Formic Acid; CO_2 to Oxalic Acid.
- Farmer Friendly Soil Health (predictive) Analyzer
- Three Coat System for Steel Structures
- Inhibitor Cement Slurry Coating for Rebars
- Electrochemical Preparation of DL-Homocysteine Thiolactone Hydrochloride from DL- Homocystine
- Electrochemical Perfluorination of Sulfolane to Perfluro Butane Sulfonyl Fluoride
- Electrochemical Preparation of Calcium Lactobionate and Calcium Gluconate
- Electrochemical Production of KIO_3
- Degradable Amorphous Alloy Coatings by Sputtering for Bioimplants
- Multicoat Protective Schemes for Concrete Structures and Bridges
- Moisture Compatible Coating for Cooling Towers
- Temporary Protective Coating for Maraging Steel & 15CDV6
- Corrosion Resistant Thermal Coating for Hydroclaves
- Al-Zn-In Galvanic Alloy Anode for Cathodic Protection
- Formulation of Neutral Paint Removing Jelly
- Corrosion Resistant Inhibitive Admixtures for Portland Pozzolana Cement
- Inhibitor Admixture for Concrete
- Cost Effective Metallic Coatings to Rebars Embedded in Concrete Structures
- Redox Active Polymer Encapsulated Lamellar (REL) Compound based Anticorrosive Coating for Reinforcement Bars
- Extraction of Calcium, Magnesium by Molten Salt Electrolysis
- Extraction of Zinc oxide and Metallic Zinc from Galvanizer Ash
- Extraction of Rare Earths and Alloys by Molten Salt Electrolysis

www.cecri.res.in

https://www.twitter.com/CSIR_CECRI

https://www.facebook.com/1CSIR.CECRI

https://www.youtube.com/CSIR-CECRI-KKDI

Published by: PPMG Section, CSIR-CECRI, Karaikudi – 630003 (Tel: 04565-241204; Email: medianodal@cecri.res.in)