



CECRI NEWS

(A monthly newsletter of CSIR-CECRI)
compilation of significant happenings

Ayurveda Day Celebrations

The **Ayurveda Day** was celebrated at CSIR-Central Electrochemical Research Institute (CSIR-CECRI), Karaikudi with a bouquet of events on November 8, 2023. **Dr. G. Kusuma**, Research Officer (Ay), Captain Srinivasa Murthy Central Ayurveda Research Institute, Chennai, CCRAS, Ministry of AYUSH, Govt. of India was the Invited Expert and Chief Guest. **Dr. R. Manasa**, Ayurveda Physician, Arimalam Vaidyasalai, Karaikudi also took part in the proceedings as an Invited Expert. An exhibition of Medicinal Plants and Posters on Ayurvedic Guidelines, Ayurvedic Medical Camp, Awareness Lecture on Ayurveda - *Way to Holistic Life* by Dr. Kusuma formed a part of the day-long celebrations. As a sequel to the above, on November 24, 2023 **Shri. Mahendra Kumar Gupta**, Joint Secretary (Admin), CSIR inaugurated the Ayurvedic Garden created at CSIR-CECRI campus with a wide collection of medicinal plants.



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India is a treasure trove of herbal plants, it is, in a way our Green Gold.

- **Shri. Narendra Modi**
Hon'ble Prime Minister and
President, CSIR



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In the Inaugural Event at the Health Centre, **Dr. T. Raju**, Chief Scientist & Chairman, Healthcare Committee, CSIR-CECRI welcomed the Experts and briefed on the day's events. **Dr. K. Ramesha**, Director, CSIR-CECRI thanked the Experts and requested the beneficiaries to make the most of the opportunity. **Dr. Kusuma** stressed on the significance of Ayurveda in our daily lives.

An **Exhibition of Medicinal Plants and Posters on Ayurvedic Guidelines** ensued in which the Experts explained in detail on the medicinal uses of the plants and major guidelines to be followed in our daily routine lives which proved to be highly informative and an eye-opener for the participants. Later, the **Ayurvedic Medical Camp** was conducted in which many participants took consultation from the Experts on their health issues. A large number of staff, dependents, pensioners and scholars took part eagerly in the forenoon events and got immensely benefitted.

In the afternoon, an **Awareness Lecture by Dr. Kusuma on Ayurveda - Way to Holistic Life** was arranged. **Dr. T. Raju** welcomed the gathering and briefed the audience on the various healthcare activities undertaken at CSIR-CECRI. **Dr. K. Ramesha**, Director, CSIR-CECRI, in his Presidential Address highlighted the importance of health and the promotional activities of **Ayush Ministry, Govt. of India** in propagation of this traditional knowledge of Ayurveda. The vital information on *Ayurveda should be preserved and passed on to the younger generation*, he said. He also quoted our



Hon'ble Prime Minister Shri. Narendra Modi in this regard: *India is a treasure trove of herbal plants, it is, in a way our Green Gold.*

Dr. Kusuma in her informative lecture delineated various aspects of Ayurveda in our daily life routine especially on **Trayo Upasthambha (supportive pillars of the body) - Ahara, Nidra and Vyayama i.e. proper Diet, Sleep and Exercise**. She began her talk with a popular quote - *You cannot buy your health, you must earn it through healthy living*. She cited various ancient ayurvedic concepts and correlated with problems in our current lifestyle due to non-adherence. **Dr. Kusuma** also prescribed healthy lifestyle practices with proper timeline to be followed particularly on preservation and promotion of health:

- Following Healthy Daily Routine (Dinacharya)
- Following Healthy Night Routine (Ratricharya)
- Following Seasonal Regimen (Ritucharya).

She informed the audience that Research has shown that any new activity if continuously performed for 21 days, it naturally and automatically becomes part of our routine and that the body and mind get accommodated with it. At the end of her talk, she answered the queries of the audience and clarified their doubts on ayurveda. The participants of all the events gained valuable insights in this regard. The events ended with Vote of Thanks by **Dr. N. Lakshminarasimhan**, Sr. Prin. Scientist, CSIR-CECRI and the Coordinator for Ayurveda Day 2023 Celebrations.



Research in Focus



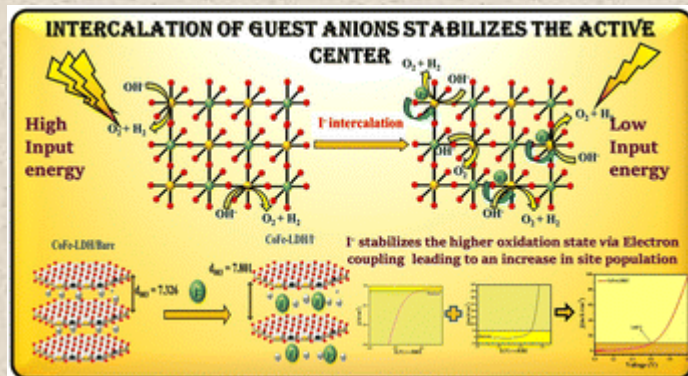
Tuning the active sites and optimizing the d-spacing value in CoFe-LDH by ex situ intercalation of guest anions: an innovative electrocatalyst for overall water splitting reaction

N. Sreenivasan, Arun Karmakar, M. Ragunath, H.N. Dhandapani, Suprobhat Singha Roy and Subrata Kundu

Catalysis Science & Technology, 13 (2023) 6377

<https://doi.org/10.1039/D3CY00859B>

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A Book on **Health and Environmental Applications of Biosensing Technologies** co-edited by **Dr. Murugan Veerapandian**, Senior Scientist, CSIR-CECRI, **Dr. James Joseph**, former Chief Scientist, CSIR-CECRI and **Dr. Mohana Marimuthu**, Associate Professor, Centre for Research, Dhanalakshmi Srinivasan University, Samayapuram, Tamil Nadu with contributions predominantly from Electrodeics and Electrocatalysis Divisional Scientists of CSIR-CECRI has been published by Elsevier.

Health and Environmental Applications of Biosensing Technologies

Clinical and Allied Health Science Perspective

Offers emerging trends in biosensor design for human and environmental health applications

Edited by

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With emerging biological threats from pathogenic microorganisms and increasing environmental pollutants, it is essential to ensure the safety needs of individuals and the ecosystem. Modern materials science and engineering has evolved over the years to better develop devices to test abnormalities. Affordability, accessibility, and reliability of any analytical system is the prime necessity for a modern diagnostic application.

Health and Environmental Applications of Biosensing Technologies: Clinical and Allied Health Science Perspective presents a detailed overview of biosensor design systems and optimal fabrication technologies to create a greater impact on various industries and help organizations break existing performance tradeoffs to deploy biosensor technologies across inter/transdisciplinary businesses. This book presents novel and emerging trends in biosensor design and healthcare applications focused on API detection, communicable/non-communicable disease diagnosis, food quality monitoring, agro-environmental analysis, bio-defense, and industrial pollutant sensing. In addition, wearable biosensors, commercial products, and safety regulations for biosensing technologies are summarized.

Key Features

- Provides a fundamental understanding on biosensor system design, biomarkers for communicable/non-communicable diseases, and bioreceptor immobilization techniques
- Provides information on principles, advanced trends, and approaches for wearable biosensors
- Covers market trends with biosensing technologies/products and their commercial challenges

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Health and Environmental Applications of Biosensing Technologies

Veerapandian • Joseph • Marimuthu

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Clinical and Allied Health Science Perspective

Edited by

Murugan Veerapandian

James Joseph

Mohana Marimuthu

Business Development Leads

- ❖ Discussion with SPMU for MoU [Nov 1]
- ❖ Review Meeting on Godi Energy's Project [Nov 2]
- ❖ Project Review Meeting with GFCL Officials [Nov 3]
- ❖ Meeting with Vayu Motors [Nov 8]
- ❖ Meeting with Tata Chemicals Ltd. [Nov 9, 16]
- ❖ Meeting with GAIL (I) Ltd. Noida [Nov 14]
- ❖ Meeting with Samnan Chemicals Pvt. Ltd. [Nov 16]
- ❖ Meeting with Shalimar Paints [Nov 21]
- ❖ Meeting with High Energy Batteries Pvt. Ltd. [Nov 21]
- ❖ Discussion with ISRO IPRC [Nov 22]
- ❖ Meeting with Zettaone Technologies Pvt. Ltd. [Nov 22]
- ❖ Review meeting on h-BN Preparation Technology [Nov 23]
- ❖ Meeting on Redox Flow Battery Mission [Nov 29, 30]
- ❖ Meeting on Green Hydrogen with Godrej Precision Engineering, Mumbai [Nov 30]
- ❖ Meeting on Green Hydrogen HP Green R&D, HPCL, Bengaluru [Nov 29]

Official Events

- ❖ Safety Committee Meeting [Nov 1]
- ❖ Patent Evaluation Committee Meeting [Nov 6]
- ❖ Engagement of Project Personnel [Nov 6, 7]
- ❖ Meeting to review the progress of on-going Civil & Electrical works [Nov 7]
- ❖ Organizing Committee Meeting for NCE-23 [Nov 9]
- ❖ HCP Project - Review Meeting [Nov 15]
- ❖ e-Office Implementation Training Session [Nov 16]
- ❖ Engagement of Junior Research Fellows (Project) [Nov 16]
- ❖ Discussion with CSIR-IGIB on CSIR Cohort Project [Nov 18]
- ❖ Rajbhasha Exams - Pragya [Nov 18, 19]
- ❖ TOLIC Meeting [Nov 22]
- ❖ Rajbhasha Exams - Prabodh [Nov 25]
- ❖ Meeting of the Dissertation-Project Works Committee [Nov 28]
- ❖ Orientation meeting of ECS-CECRI Student Chapter with The Electrochemical Society (ECS), USA [Nov 28]
- ❖ Meeting of the Student Academics Committee [Nov 29]

Skill Development Activities

Skill Development Training Programmes:

- ❖ A Skill Development Training Programme on **Electroplating and Metal Finishing** was organized by CSIR-CECRI during Nov 6-10, 2023. A total of 27 participants took part in this training programme.
- ❖ A Skill Development Training Programme on **Electrochemical Power Sources: Lithium-ion battery - Science & Technology** was organized by CSIR-CECRI during Nov 6-10, 2023. A total of 27 participants took part in this training programme.
- ❖ A Skill Development Training Programme on **Additive Manufacturing: A Technology of Rapid Customization**

was organized by CSIR-CECRI during Nov 15-17, 2023. A total of 21 participants got trained.

- ❖ **Campus Placement Drive** for Skill Trainees in the area of Electroplating by Wipro Infrastructure Engineering [Nov 28]

JIGYASA:

- ❖ More than 500 School Students (studying in XII std) and 26 Teachers from various Govt./Govt. aided Schools in Sivagangai District visited CSIR-CECRI, Karaikudi under "**Naan Mudhalvan**" Scheme and witnessed the ongoing R&D Activities in the Institute,

CFE and AcSIR Highlights

- ❖ CFE Management Affairs Committee Meeting [Nov 23]
- ❖ Final Examination for AcSIR and IDDP - Aug 2023 Students (SMD Lab Course) [Nov 2]
- ❖ Lecture on **X-Ray Techniques** by Dr. N. Lakshminarasimhan to Research Scholars Forum [Nov 3]
- ❖ DAC Meeting for Ms. P.V. Sreya [Nov 6]
- ❖ DAC Meeting for Ms. Ammu Surendran [Nov 9]
- ❖ Synopsis Submission of Mr. A. Bebin, AcSIR Scholar (Guide: Dr. M. Kathiresan) [Nov 20]
- ❖ Meeting with AcSIR Scholars [Nov 22]
- ❖ PhD Viva voce examination for Mr. A. Abbasriyaludeen, AcSIR Scholar (Guide: Dr. P. Murugan) [Nov 29]

Invited Lecture

Professor Dr. Atef Youssef El-Kess Shenouda, C.V. Raman International Fellow from Batteries Technology Department, Central Metallurgical Research and Development Institute (CMRDI), Egypt delivered a talk

on **Egypt Culture in the Ancient Age**. His talk gave a brief history of the various traditional and cultural concepts which forms the basis of many scientific theories now. He also gave a glimpse of the strong bilateral ties.

Workshop on Lab Safety

A One Day Workshop on *Lab Safety* was conducted at CSIR-CECRI, Karaikudi on November 17, 2023 which was the second edition organized by **Lab Safety Committee (LASAC), CSIR-CECRI**. More than 150 participants including Scientists, Staff Members, Research Scholars, IDDP Scholars, CSIR-TWAS Fellows, BTech Students, Project Assistants/Associates and Contract Manpower actively took part in the Workshop.

Dr. J. Mathiyarasu, Chairman, LASAC, CSIR-CECRI delivered the Welcome Address. **Dr. P. Tamilarasan**, Scientist, CSIR-CECRI gave a glimpse of the activities of LASAC and a brief introduction about the Workshop. In his Inaugural Address through Virtual Mode, **Dr. K. Ramesha**, Director, CSIR-CECRI appreciated the efforts of LASAC and called upon the participants to make effective use of it. **Dr. S.T. Nishanthi**, Scientist, CSIR-CECRI proposed vote of thanks.

The **Technical Session** had 5 lectures and 1 practical demonstration: (i) *Introduction to Lab Safety* by Dr. J. Mathiyarasu, (ii) *Chemical and Biological Safety* by Dr. P. Tamilarasan, (iii) *Fire and Heat Safety* by Dr. S.T. Nishanthi (iv) *Radiation and Compressed Gas Safety* by Dr. P. Tamilarasan and (v) *Cryogenic and Electrical Safety* (by Er. A. Rathishkumar).

The **Practical Demonstration** was conducted by the Mr. S. Gopal, Security officer, CSIR-CECRI, Mr. A. Kishor Kumar, Security Assistant, CSIR-CECRI and their Team Members in which Good Lab Safety Practices, DOs and DON'Ts, Emergency Response and Proper Use of Personal Protective Equipment were demonstrated. All the participants got immensely benefited by lectures and demo covering all vital aspects of Lab Safety and the safety measures to be followed and precautions to be taken.



Recent Research Publication

- ❖ 'Total electrode' and 'intrinsic' activity parameters in water electrolysis: a comprehensive investigation
Arun Karmakar, Bhagyashri B. Kamble, M. Ragnath, Pradeep Gudlurd and Subrata Kundu
Journal of Materials Chemistry A, 11 (2023) 26023; <https://doi.org/10.1039/D3TA06370D>

Honours and Awards



❖ **Dr. Santhoshkumar D. Bhat**, Senior Principal Scientist, CSIR-CECRI Chennai Unit, CSIR Madras Complex, Taramani, Chennai has been selected for the prestigious **Raman Research Fellowship** of CSIR for the year 2023-2024 for carrying out research with Professor William E. Mustain, Department of Chemical Engineering, College of Engineering and Computing, University of South Carolina, USA.

Visit of Joint Secretary (Admin), CSIR

Shri. Mahendra Kumar Gupta, Joint Secretary (Administration), CSIR, New Delhi visited CSIR-CECRI, Karaikudi on November 24, 2023 and had an eventful day in CSIR-CECRI Campus. At the start of the day, he inaugurated the **Ayurvedic Garden** created at CSIR-CECRI campus with a wide collection of medicinal plants. He was briefed on the relevant details like name of the plant species, botanical name, family, common name, name in Tamil language, medicinal uses etc. depicted in the hoardings placed on the walls for the easy understanding of the visitors.

Then, he graced the Children's Day Celebrations of Sishu Vidyalaya, CSIR-CECRI Campus as the Chief Guest. Shri. Gupta addressed all the staff members of

CSIR-CECRI Karaikudi and in his address he highlighted on the various developmental activities in CSIR especially on the digitization processes in all CSIR Labs.

He wholeheartedly appreciated CSIR-CECRI for being the frontrunners in all the developmental activities and achieving timely targets. Earlier, he administered **National Integration Pledge** to all the participants and read out the **PREAMBLE of Constitution of India** in commemoration of **Constitution Day Celebration**. After a brief discussion at Director's Office, he had an interaction with the ERP Team of CSIR-CECRI. Later, he had an engaging conversation with the newly recruited Administration and Technical Staff Members of CSIR-CECRI.



Training Programme on e-Office

Implementation of **e-Office** is in full swing in CSIR for all official noting purposes. CSIR-CECRI has been spearheading the digitization activities in CSIR and has initiated implementing the e-Office with a vision of achieving 100% implementation soon. Therefore, a training session was arranged for all the staff members of CSIR-CECRI on November 16, 2023. **Dr. R. Sindhuja**, Sr. Scientist, Computer and Networking Unit, CSIR-CECRI gave a detailed presentation on the modules of e-Office explaining each and every process in detail with live demos. A large number of staff members across all cadres participated enthusiastically and gained valuable inputs. Many also got their doubts clarified. from the resource person.



Snapshots



Skill Development Training Programmes organized by CSIR-CECRI



Skill Development Training Programmes organized by CSIR-CECRI



Town Official Language Implementation Committee Meeting



Invited Lecture by Sir CV Raman Fellow



Visit of Joint Secretary (Administration), CSIR to CSIR-CECRI, Karaikudi



- ❖ Indigenous Li-ion battery
- ❖ Indigenous Sodium Ion Battery
- ❖ Performance Improved Lead Acid Battery
- ❖ CO₂ 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 CO₂ and butadiene to Adipic Acid; CO₂ to Formic Acid; CO₂ 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 KIO₃
- ❖ 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

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