

High - End Workshop on “Electrochemical Evaluation of Membrane-Electrode-Assembly for Fuel Cells” (Physical mode)

(Under the KARYASHALA Scheme – a SERB Initiative)



December 15-22, 2021



Funded by:

Science and Engineering Research Board (SERB), Department of Science and Technology, Government of India Under Accelerate Vigyan Scheme



CIPET सि पे ट
probe · perform · practice · Plastics

Organized by:

CIPET: SARP - Advanced Polymer Design and Development Research Laboratory (APDDRL), Bengaluru

KARYASHALA OBJECTIVES: ‘KARYASHALA’ is aimed to improve research productivity of promising PG and PhD students from universities/colleges through high-end workshops on specific themes. This program aims to provide opportunities to acquire specialized research skills and provide hands-on experience to the students primarily from universities, colleges, private academic institutions, and newly established institutes in handling/troubleshooting of high-end scientific instruments and such skill development on themes required for research work. The program is meant to support motivated PG and Ph.D. level students, who are having a strong willingness to get

excellence in their scientific and engineering research pursuits.

ABOUT WORKSHOP: Fuel cell is the sustainable energy generation device that converts chemical energy of fuel to electricity with high efficiency than the conventional combustion-based technology. Membrane electrode assembly (MEA) is the heart of fuel cell where electrochemical reaction takes place in the presence of catalyst to generate electricity. MEA usually consist of anode and cathode gas diffusion electrodes (loaded with catalyst and gas diffusion layer) and proton exchange membrane. The efficiency of fuel cell depends upon the MEA characteristics such as oxidation-reduction potential, proton conductivity, Ohmic resistance, etc., hence electrochemical characterization of MEA is the key tools to optimize fuel cell performance. This workshop aims to inculcate this research skill to the new generation PG/Ph.D. students for acquaintance with fuel cell technology, its potential for energy generation, and key components of the fuel cells specially polymer electrolyte membrane fuel cell (PEMFC) i.e. H₂/O₂ and methanol fuel cells.

Objectives:

- Teach concept of fuel cells for energy generation, emphasis will be given on hydrogen/oxygen and direct methanol fuel cells.
- Train in fabrication of proton exchange membrane for PEMFC application using polymer based nanocomposites.
- Demonstrate and train in membrane-electrode-assembly preparation through coating, casting, spraying, compression techniques.
- Inculcate in electrochemical characterization techniques of MEA, to find proton conductivity and oxidation-reduction potential.
- Demonstrate and train in MEA evaluation using electrochemical workstation/ impedance spectroscopy, provide the hand on experience to use electrochemical workstations

DURATION AND CERTIFICATION: The duration of this high-end workshop will be 8 days (December 15-22, 2021). A certificate

regarding successful completion of workshop shall be issued to the participants by the CIPET: SARP – APDDRL, Bengaluru. Participants not completing the requisite period will not be issued any certificate.

NATURE OF SUPPORT: Necessary expenses such as, stationery, consumables, accommodation, food, etc. for the participating students will be borne by the CIPET: SARP – APDDRL, Bengaluru through SERB funding support for the whole workshop period (pro-rata basis). The participating students will also be eligible for TA reimbursement for their journey to the host institute from their hometown/home institute, both ways, as per GoI norms.

HOW TO APPLY: Interested PG and Ph.D. Students (science and engineering stream) shall apply for the High-End Workshops through Event Organizers (EOs) only. Applicant must send duly filled application form in the prescribed format to the **Event Organizer so as to reach on or before 30th November 2021.** The applicant must send a single file containing the (i) registration form, (ii) Endorsement cum No Objection Certificate for allowing your student to participate in workshop, if selected, for “WORKSHOP” in physical mode, (iii) Degree certificates, (v) UG/PG marksheet, (vi) Copy of Aadhar card, and (vii) statement of research interest; to the event organizer by email (jay21480@yahoo.co.in).

SELECTION OF CANDIDATES: The selection of the eligible students for High-End Workshops will be done based on the recommendations of the Selection Committee constituted for this purpose by the CIPET: SARP – APDDRL, Bengaluru. Selected candidate required to pay registration fees of Rs. 1000/00.

ABOUT CIPET : SARP - APDDRL – BENGALURU: School for Advanced Research in Petrochemicals (SARP) - APDDRL, one of the R&D wings of Central Institute of Petrochemicals Engineering and Technology (CIPET) is located at Devanahalli, Bengaluru. SARP-APDDRL, a 'one-stop facility' for conceptualization of novel research ideas, is well-equipped with

facilities for Material Development to Product Design & Development and Process & Design Validation. SARP-APDDRL works towards articulating research ideas to develop novel technologies on environmentally friendly solutions for sustainable polymers, plastics waste management, recycling & value addition, fuel efficient transportation, power storage and energy harvesting devices, polymers for bio-medical & healthcare applications, process & application development for cellular plastics, product design & simulation, process validation and 3D-printing technologies, to keep pace with the global scientific community.

PATRONS:

- Prof. (Dr.) Shishir Sinha, Hon'ble Director General - CIPET
- Dr. R. Joseph Bensingh, Sr. Scientist & Head, CIPET:SARP – APDDRL, Bengaluru

TENTATIVE LIST OF RESOURCE PERSONS:

- Prof. Bijay P. Tripathi, IIT Delhi
- Dr. A. K. Palai, SARP: LARPM, Bhubaneswar
- Dr. Kingshuk Dutta, SARP: APDDRL, Bengaluru
- Prof. Alagumalai Nagendran, Alagappa Govt. Arts College
- Dr. Wasim Feroze G.S., SARP: APDDRL, Bengaluru
- Prof. Prasenjit Bhunia, Silda Chandra Sekhar College, Vidyasagar University, Midnapore
- Dr. Lakshmi Unnikrishnan, SARP: APDDRL, Bengaluru
- Dr. G. Velayutham, Sainergy Fuel Cell India Pvt. Ltd., Chennai
- Dr. Ananthakumar Ramadoss, SARP: LARPM, Bhubaneswar

EVENT ORGANIZER:

Dr. Jaydevsinh M. Gohil, Jr. Scientist,
CIPET: SARP - Advanced Polymer Design and Development Research
Laboratory (APDDRL), B
7P, Hi-Tech Defence and Aerospace Park (IT Sector), Bengaluru - 562 149
E-mail: jay21480@yahoo.co.in; Mob. No. 8347318653

Registration Form

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**CIPET: SARP - Advanced Polymer Design and Development Research Laboratory (APDDRL),
Bengaluru**

Photograph

Name:

Course (PG/Ph.D.):

Enrolment Number:

Year of Study:

Department:

Institute/University:

Mailing Address:

Mobile:

E Mail:

The above information provided is true and to the best of my knowledge. If, selected, I agree to abide by the rules and regulations of the program and CIPET: SARP - APDDRL, Bengaluru.

Signature of Candidate

Endorsement cum No Objection Certificate from the Head of the Department/ Thesis Supervisor

(To be given on University/ Institute/ College Letter head)

This is to certify that:

1. Mr. / Ms. / Mrs. _____, is a bonafide student of our University / Institute / College and will assume full responsibility for actively participating in the High-End Workshop titled “*Electrochemical Evaluation of Membrane-Electrode-Assembly for Fuel Cells*” sponsored by SERB-DST under the Accelerate Vigyan Scheme, scheduled from 15th to 22nd December 2021.
2. The Applicant is a Full-time / part-time student of our University/ Institute/ College and enrolled in M Tech / M.S. / PhD Programme in Department.
3. The candidate has secured _____ % / CGPA / CPI till date (if applicable).
4. The candidate is currently carrying out research/project as a part of his/her course curriculum and has completed the core courses of the program.
5. The University/ Institute/ College also endorses the conduct of the applicant to be of highest order who bears a good moral character.
6. The University/ Institute/ College has “No-Objection” for the candidate participation during the above said period.
7. The candidate, if selected for participation, shall be duly permitted to attend the workshop on physical mode. The University/ Institute/ College may provide the necessary facilitation needed for this purpose.

Date:

Signature and Seal with name

Place:

(Head of the Department/ Thesis Supervisor)