



Weekly Seminar Program – (2023-24)
Department of Physics – Bharathiar University
Coimbatore- 641046

Seminar - 5



Mr. Deepak A.

Research scholar (II Year)
Molecular Simulation Laboratory,
Department of Physics, Bharathiar University.

Speaks on

“Green Hydrogen – Paving the Way to Carbon-Neutral Energy Environment”

Abstract

With the urgency to combat climate change and transition towards sustainable energy sources, green hydrogen offers a crucial alternative. Hydrogen produced with zero carbon emissions through water electrolysis using electricity generated from renewable sources like solar, wind, or hydropower is referred to as green hydrogen. In water electrolysis, the resultant by-products comprise oxygen (O_2) originating from the anode and hydrogen (H_2) emerging from the cathode in the electrolyzer. The significance of green hydrogen is two-fold. Firstly, it offers an alternative to conventional hydrogen production methods which rely mainly on fossil fuels such as steam methane reforming (SMR), biomass gasification, etc., which results in carbon emission. Secondly, it functions as a versatile energy carrier and storage solution, enabling the integration of renewable energy into various sectors such as transportation, industrial sectors, etc. Although water electrolysis is a promising method for producing green hydrogen, there are some disadvantages and difficulties such as energy-intensive, low efficiency, scaling up, storing, etc., are need to be taken into account. Currently, the state-of-the-art electrocatalysts for water splitting are IrO_2 or RuO_2 for the O_2 evolution reaction (OER) and Pt for the H_2 evolution reaction (HER) in acidic solutions and Ni electrodes for HER and stainless steel composites for OER in alkaline solutions. Nonetheless, the high cost, limited availability, and inadequate durability of noble metal-derived electrocatalysts pose obstacles to the widespread production of hydrogen through water electrolysis on a larger scale, hence the current research emphasizes on high-efficiency noble metal-free alternatives. This presentation aims to give insight into green hydrogen production by means of water electrolysis and its utilization in fuel cells.

About the Speaker

Mr. Deepak A is from Erode and has completed his undergraduate in Physics at Nandha Arts and Science College, Erode, and his postgraduate in Physics at Bharathiar University, Coimbatore. His field of research is centered on water electrolysis. He is currently focusing on designing two-dimensional materials as efficient electrocatalysts for water-splitting.

Venue: Sir C.V. Raman Hall

Date: 22.08.2023

Time: 10.00 am

Kindly be seated by 10:00 am and switch off your mobile phone during the lecture.

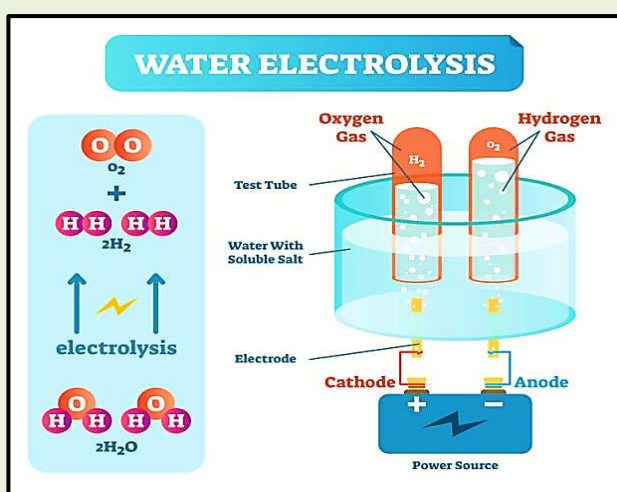
All are cordially invited.

Coordinator (General Seminar)

Head of the Department

Agenda

Time	Event	Name	Designation
10. 00 am	குறள் வணக்கம்	Mr. Hari Prahadhish K	II M. Sc., (Physics)
10. 05 am	Biography of Scientists (Dr.Homi Bhabha)	Ms. Bhuvaneshwari B	I M.Sc., (Physics)
10. 10 am	Recent Physics News	Ms. Santhya T	II M. Sc., (Physics)
10. 15 am	Seminar	Mr. Deepak A	Research Scholar, Molecular Simulation Laboratory
10. 45 am	பாரதியின் குரல்	Mr. Perumal G	I M.Sc., (Physics)



Department of Physics
Bharathiar University



Tea & Snacks at 10.50 am