VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"Jnana Sangama" Belagavi – 590018

Mini Project Report on

Optimization of ZnO Nanostructures for Enhanced Photocatalytic Hydrogen generation

Submitted in partial fulfillment of the requirements for the award of degree

BACHELOR OF ENGINEERING
IN
ELECTRONICS & COMMUNICATION ENGINEERING

Submitted By

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CERTIFICATE

This is to certify that the following students,

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has submitted Project synopsis on **"Optimization of ZnO Nanostructures for Enhanced Photocatalytic Hydrogen generation"** for VI Semester B.E. in Electronics & Communication Engineering during the academic year 2023-24. The mini project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the Bachelor of Engineering Degree.

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ABSTRACT

The project focuses on enhancing hydrogen production through photocatalysis by optimizing ZnO nanostructures. ZnO is a robust and widely researched photocatalyst known for its high stability and broad bandgap, which allows it to absorb a wide range of light. By refining ZnO's properties, such as its size, shape, and surface characteristics, we can improve its efficiency in generating hydrogen.In this study, we investigate various techniques to boost ZnO's performance, including modifying its nanostructure, introducing dopants, and creating composite materials. These modifications are aimed at increasing light absorption, enlarging the active surface area, and enhancing charge carrier movement.The improvements lead to a significant increase in hydrogen generation rates when ZnO is exposed to visible light. This advancement is crucial for developing more efficient solar energy conversion systems. By making hydrogen production more effective, the project contributes to the broader goal of creating sustainable and environmentally friendly energy sources, reducing dependence on non-renewable resources, and supporting the transition to a cleaner energy future.