

VISVESVARAYA TECHNOLOGICAL UNIVERSITY



Project Report

on

***DESIGN AND CONSTRUCTION OF PHOTOBIOREACTOR
FOR MASS CULTIVATION OF MICROALGAE FOR
BIOHYDROGEN PRODUCTION***

Submitted in partial fulfillment of the requirement for the award of

BACHELOR OF ENGINEERING

IN

BIOTECHNOLOGY

by

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ABSTRACT

Biological hydrogen production has been known for over a century and research directed at applying this process to a practical means of hydrogen fuel production has been carried out for over a quarter century. Biological hydrogen production by the green alga *Chlamydomonas reinhardtii* under sulfur deprived conditions has attracted great interest due to the fundamental and practical importance of the process. The green alga, *Chlamydomonas reinhardtii* is capable of sustained H₂ photoproduction when grown under sulfur-deprived conditions.

Our project focuses on using this approach to produce hydrogen from algae and to optimize the production of algae by varying various parameters such as light-dark cycles, temperature, media composition, mixing of culture, cell densities and pH. Upon completion of the project we were able to determine the optimum conditions at which we were able to produce maximum hydrogen at lab scale with provided lab resources.

Photobioreactor design was done using two parameters one is mixing and another was growth kinetics consideration. In this photobioreactor RTD studies was performed and also studied growth kinetics

KEYWORDS: *BioHydrogen, Green Algae, Anaerobiosis, Alternative fuel, Biofuel, Sulfur Deprivation, Optimization Parameters, Chlamydomonas reinhardtii. Photo bio Reactor design*