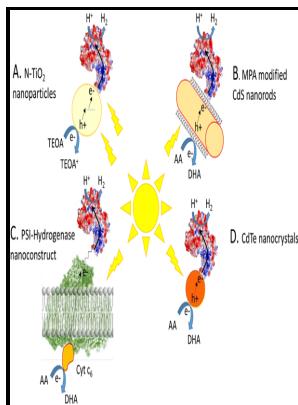


# Use of immobilized hydrogenase for hydrogen production

**Directorate-General Information Market and Innovation, Commission of the European Communities - PHOTOBIOLOGICAL PRODUCTION OF HYDROGEN AND ELECTRICITY**



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## Biohydrogen production by *Chlorella vulgaris* and *Scenedesmus obliquus* immobilized cultivated in artificial wastewater under different light quality

Microbial communities driven by molecular hydrogen have, in fact, been found in deep-sea settings where other sources of energy from are not available. A structured kinetic model was constructed to describe the competition between cell mass generation and IBT production.

### Immobilized algal cells used for hydrogen production

The electrons acquired from water splitting are transferred through PSII to photosystem I PSI. As has been shown previously, the stoichiometric ratio of hydrogen to oxygen is, in general, not equal to two. With the restoration of the required nutrients, the cells are then able to catabolize this polymer.

### Use of cell

Error bars indicate the means  $\pm$  standard deviations from three biological repetitions. The present study explores the production of hydrogen by *Chlorella vulgaris* and *Scenedesmus obliquus* immobilized cells in alginate beads as a renewable energy source, cultivated in artificial wastewater combining the effect of blue and purple light and dark anaerobic condition. Experimental setup and procedure For the study of hydrogen production, the two-stage method was used, where hydrogen and oxygen synthesis occur partially separated.

### Biohydrogen production by immobilized *Chlorella* sp. using cycles of oxygenic photosynthesis and anaerobiosis

While this bioengineering work was being done at the Sinskey laboratory at MIT, the researchers at the Worden laboratory at Michigan State were working on the design and construction of the required specialty bioreactor for incompatible gasses BIG that would allow the safe feeding of microbes on Carbon Dioxide, Hydrogen, and Oxygen without explosive results. Antal T, Lindblad P 2005 Production of H<sub>2</sub> by sulphur-deprived cells of the unicellular cyanobacteria *Gloeocapsa alpicola* and *Synechocystis* sp. Consent to submit has been received explicitly from all co-

authors, as well as from the responsible authorities - tacitly or explicitly - at the Autonomous University of Carmen, where the work has been carried out.

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