



Biohydrogen production by dark fermentation : Current trends and main scientific challenges

Eric Trably

► To cite this version:

Eric Trably. Biohydrogen production by dark fermentation : Current trends and main scientific challenges. ICABB 2013 - International Conference on Advances Biotechnology and Bioinformatics, Dr. D. Y. Patil Biotechnology and Bioinformatics Institute. IND., Nov 2013, Pune, India. hal-01189752

HAL Id: hal-01189752

<https://hal.science/hal-01189752>

Submitted on 3 Jun 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Biohydrogen production by dark fermentation : Current trends and main scientific challenges

Trably E.

INRA, UR050, Laboratoire de Biotechnologie de l'Environnement, Avenue des Etangs, F-11100 Narbonne,

France. eric.trably@supagro.inra.fr

The degradation of our natural environment and energy crisis are two vital issues for sustainable development worldwide. In this context, the production of bioenergy from lignocellulosic biomass or urban residues is receiving ever-increasing interest. Among the different processes, biohydrogen production by dark fermentation presents considerable advantages since bioH₂ is renewable, carbon free and environmental friendly. An overview of the literature shows a worldwide interest of the scientific community to propose new ways of carbon-free biological processes having a low energy demand. In particular, biohydrogen production from agricultural waste is very advantageous since agri-wastes are abundant, cheap, renewable and highly biodegradable. However, biological conversion to biohydrogen is often limited by the accessibility of readily degradable sugars that are embedded in the lignin network. Considering that such wastes are complex substrates and can be degraded biologically by complex microbial ecosystems, the current trends and recent findings in biotechnological development are here presented, with a special focus on the key operational parameters such as pH, partial pressure, temperature and microbial actors. Finally, the main scientific challenges are exposed and discussed to facilitate further research in this domain.

KEYWORDS: Biohydrogen, dark fermentation, biogas, hydrogen, methane, physicochemical treatment, operational parameters