ELSEVIER

Desalination 169 (2004) 101–102

DESALINATION

www.elsevier.com/locate/desal

Erratum

Erratum to: "Application of gas separation to recover biohydrogen produced by *Thiocapsa roseopersicina*"*

[Desalination 163 (2004) 261–265]

R. Horváth[a], T. Orosz[b], B. Bálint[c], M. Wessling[d], G.H. Koops[d], G.C. Kapantaidakis[d], K. Bélafi-Bakó[a]**

[a]*Research Institute of Chemical and Process Engineering, Egyetem u. 2., 8200 Veszprém, Hungary Tel. +36 (88) 405-303; Fax +36 (88) 424-424; email: bako@mukki.richem.hu*
[b]*Department of Environmental Engineering and Chemical Technology, University of Veszprém, Egyetem u. 10., Veszprém, Hungary*
[c]*Department of Biotechnology, University of Szeged, Temesvári krt. 62., 6726 Szeged, Hungary*
[d]*Membrane Technology Group, University of Twente, P.O. Box 217, 7500 AE Enschede, The Netherlands*

The correct **Introduction** should read:

1. Introduction

Due to the fear of the depletion of resources and the growth of environmental awareness more and more researches have set out for seeking alternative energy sources in recent days. Among the alternative energy carriers, hydrogen is preferred because it burns to waste-free water vapour when utilized ("clean fuel"). Moreover hydrogen can be produced in many ways, even by environmentally safe methods such as biological systems.

Biological production of hydrogen can be carried out by photoautotrophic or photoheterotrophic organisms [1,2]. For photoautotrophic H_2 production cyanobacteria are among the ideal candidates since they are capable of H_2 evolution, and have simple nutritional requirements, they can grow using N_2, CO_2, water and mineral salts, with light as the only energy source. Photoheterotrophic microbes can produce hydrogen by using organic carbon sources.

In both systems hydrogenases are the enzymes capable to catalyse one of the simplest reaction in biology: reduction of protons or oxidation of molecular hydrogen, according to the following scheme:

$$2H^+ + 2e^- \rightarrow H_2 \qquad H_2 \rightarrow 2H^+ + 2e^-$$

The structure of hydrogenases is extremely interesting and peculiar [3]. They have metallic centres containing either iron or both iron and nickel. The [NiFe] hydrogenases occur more

*PII of the original article: S0011-9164(04)00092-X

**Corresponding author

doi:10.1016/j.desal.2004.08.001

frequently in microorganisms and these enzymes contain at least two subunits. The smaller one is about 30 kDa, while the other one is twice as large. To the smaller subunit so called iron-sulphur clusters (Fe_xS_4, $x = 3$ or 4) are connected [3,4], which assure the electron transport within the protein complex. The catalytic site of the enzyme is located in the large subunit.

In this research hydrogen is produced by an anaerobic bacterium called *Thiocapsa roseopersicina*. It is a gram-negative, anaerobic, photosynthetic purple bacterium, which can be observed as a not too mobile coccus in the microscope. Under anaerobic conditions reduced sulphur compounds are used for the photosynthesis (thiosulphate, sulphide), but organic sources (glucose, acetate) can provide the electrons, as well.

The bacterium has at least two membrane-bound hydrogenase enzymes. One of these enzymes has rather advantageous features from biotechnology point of view. It is extremely stable, its activity is much higher at 80°C that at room temperature, although the optimal temperature for growth is 28°C.

Separation of hydrogen produced mainly from the inert gas, nitrogen is our aim by a membrane process and our first task was to test the membrane. Membranes have already been applied for hydrogen separation, several types of gas separation membranes were developed, like palladium coated ceramic or alloy membranes [5,6], natural rubber [7], poly(vinyl-chloride), polyacrylonitrile [8], polyethylene terephtalate [9], polyamide [10], poly(etherketone)s [11], polyimides [12], etc.