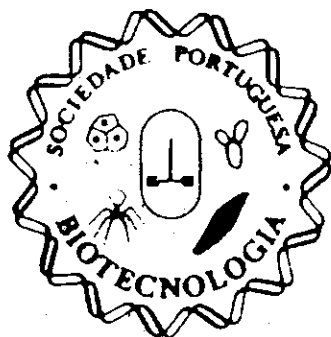




IV Iberian Congress on Biotechnology
I Ibero-American Meeting on Biotechnology

BIOTEC'98



BOOK OF ABSTRACTS



Edited by

MANUEL MOTA and EUGÉNIO C. FERREIRA

Fermentation of Low Grade Glycerol by *Clostridium butyricum* and *Clostridium acetobutylicum* Strains

M. González-Pajuelo, J.C. Andrade and I. Vasconcelos
Escola Superior de Biotecnologia, Porto PORTUGAL

Keywords: glycerol, 1,3-propanediol, butanol, *Cl. butyricum*, *Cl. acetobutylicum*

In recent years there has been an increasing interest in using Biodiesel as a less pollutant, alternative fuel [1]. The Biodiesel is produced by the transesterification of plant seed oils and yields glycerol as the main by-product. A subsequent utilisation of this "low grade" glycerol could help to decrease the Biodiesel production costs and facilitate the implementation of Biodiesel as an alternative fuel.

It has been shown that some clostridial species can ferment glycerol. *Clostridium butyricum* can use glycerol as the sole carbon source with a high conversion to 1,3-propanediol, which can be used as a monomer on biodegradable polymers synthesis. *Clostridium acetobutylicum* can use glycerol as a co-substrate of glucose to produce solvents such as butanol.

In this work a low grade glycerol, obtained through the transesterification process using rape seed oil, was used without prior purification.

Batch fermentations regulated at pH 6.5 were performed with *Cl. butyricum* VPI 3266 and VPI 1718. A concentration of glycerol as high as 40 g/l could be fermented with a maximum conversion of 0.60 g 1,3-propanediol/ g glycerol consumed and a 100% consumption of this glycerol.

Continuous cultures of *Cl. acetobutylicum* ATCC 4259 were performed at different pH values. A maximum concentration of butanol of 8.4 g/l was achieved.

Attempts to optimize culture conditions in order to improve the efficiency of these processes are still under investigation.

[1] Chowdhury, J and Fouhy, K, *Chem. Eng.*, 100, 35-39, 1993.