Annals of the Academy of Romanian Scientists
Online Edition Series on Physics and Chemistry Sciences
ISSN 2559 – 1061 Volume 3, Number 2/2018

CONTINUOUS GLUCOSE FERMENTATION BY *CLOSTRIDIUM ACETOBUTYLICUM* – KINETICS UNDER ACIDOGENESIS AND SOLVENTOGENESIS CONDITIONS*

Francesca RAGANATI[1], Alessandra PROCENTESE[2], Mariateresa FERONE[3], Giuseppe OLIVIERI[4], Maria Elena RUSSO[5], Piero SALATINO[6], Antonio MARZOCCHELLA[7]

Abstract. *The paper reports the characterization of the cell growth kinetics and of the specific butanol production rate of Clostridium acetobutylicum DSM 792 adopting glucose as carbon source. As regards the acidogenesis phase, the attention was focused on the cell growth kinetics as well as on energetics and yield of the fermentation. Tests were carried out in a CSTR operated under controlled pH. As regards the solventogenesis phase, the attention was focused on the specific butanol production rate. Tests were carried out in a CSTR equipped with a microfiltration unit. The biomass in the broth was classified as an heterogeneous cell population consisting of acidogenic cells, solventogenic cells, and spores.*

Keywords: growth rate, butanol production rate, *clostridium acetobutylicum*, glucose

1. Introduction

The apprehension over greenhouse gas emission from fossil fuels leading to global warming has caused the biofuels to have gained significant attention by the scientific and the industrial communities. Among the various biofuels, butanol is a promising one because it is characterized by high energy content, low miscibility

[1]Assistant Professor, PhD, Università degli Studi di Napoli Federico II, Dipartimento di Ingegneria Chimica, dei Materiali e della Produzione Industriale (DICMaPI) – P.le V. Tecchio 80, 80125 Napoli, Italy (e-mail: francesca.raganati@unina.it).
[2]PhD, Istituto di Ricerche sulla Combustione – Consiglio Nazionale delle Ricerche, P.le V. Tecchio 80, 80125 Napoli, Italy (a.procentese@irc.cnr.it).
[3]PhD, Università degli Studi di Napoli Federico II, DICMaPI – P.le V. Tecchio 80, 80125 Napoli, Italy (e-mail: mariateresa.ferone@unina.it)
[4]Assistant Professor, PhD, Università degli Studi di Napoli Federico II, DICMaPI – P.le V. Tecchio 80, 80125 Napoli, Italy (e-mail: giolivie @unina.it).
[5]PhD, Istituto di Ricerche sulla Combustione – Consiglio Nazionale delle Ricerche, P.le V. Tecchio 80, 80125 Napoli, Italy (m.russo@irc.cnr.it).
[6]Prof., PhD, Università degli Studi di Napoli Federico II, DICMaPI – P.le V. Tecchio 80, 80125 Napoli, Italy (e-mail: piero.salatino @unina.it).
[7]Prof., PhD, Università degli Studi di Napoli Federico II, DICMaPI – P.le V. Tecchio 80, 80125 Napoli, Italy (e-mail: antonio.marzocchella @unina.it).

* **The paper includes, in its most part, results form Alessandra Procentese's PhD Thesis "Processes for Biobutanol Production from Renewable Resources", http://www.fedoa.unina.it/10172/1/TesiDottorato_AlessandraProcentese_240315.pdf**