

REGATA

Rede Galega de Tratamento de Augas

Research Stays 2015

Waste to bioplastic conversion by the moderate halophilic bacteria *Halomonas boliviensis*

April 15th, 2015 | July 15th, 2015

Objectives

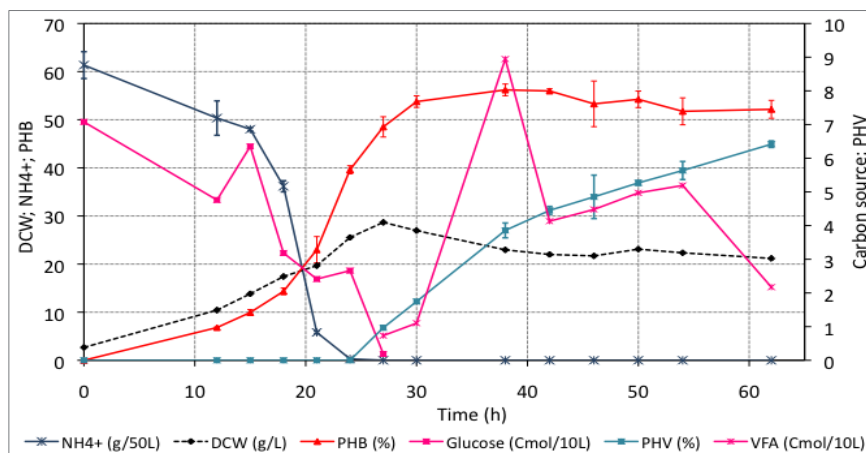
The aim of this research was to evaluate the performance of the bacteria *Halomonas boliviensis* using VFA as carbon source for polyhydroxyalkanoates (PHA) production.

Methodology

After previous experiments in flask scale, testing different VFA media composition, a 2 L bioreactor was used feeding a mixture composed by (% v/v): 58, acetic acid; 25, propionic acid; 6, butyric acid and 11, valeric acid. The bioreactor was operated following a two-stage fed-batch strategy. During the first stage, glucose was used as carbon source until nitrogen exhaustion. The second stage took place under nitrogen limitation and the carbon source fed was a synthetic mixture of VFA.

Results

The results obtained at bioreactor scale are shown in the next figure.



After 62 hours of operation, 21 g/L of biomass was obtained, where the 58% of the total weight of the biomass was PHA. The type of PHA accumulated was a copolymer of P(3HB-co-3HV) with a content of 9.6% mol P(3HV).

Highlights

It was possible to obtain PHA with a pure culture, despite the toxic properties of the VFA. Besides, of the P(3HV) monomer (poly-3-hydroxyvalerate) together with the P(3HB) (poly-3-hydroxybutyrate) improves the flexibility and resistance of the plastic, by the modification of the thermomechanical properties.

Researcher

María García-Torreiro



Group of Environmental Engineering and Bioprocesses (Biogroup)

University of Santiago de Compostela

Responsible: Prof. Juan M. Lema

Host Institution

Institut für Molekulare Mikrobiologie und Biotechnologie

Westfälische Wilhelms-Universität Münster, Germany

Responsible: Prof. Alexander Steinbüchel



Contact Network details

Chair of the Network REGATA

Juan M. Lema
Professor of Chemical Engineering
Univ. Santiago de Compostela, Spain
Juan.Lema@usc.es

Research stays Coordinator

M^a. Ángeles Sanroman Braga
Professor of Chemical Engineering.
University of Vigo, Spain.
sanroman@uvigo.es

Organised by

Universidade de Vigo



UNIVERSIDADE DA CORUÑA

Supported by

