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CONTINUE

3rd International Conference on Bioresource Technology for Bioenergy, Bioproducts & Environmental Sustainability

Submission ID

276

Title

Carbon xerogels as a novel platform for the immobilization of L-asparaginase

Abstract

L-asparaginase (ASNase, EC 3.5.1.1) is an aminohydrolase enzyme, currently used in the pharmaceutical field as an anticancer drug for the treatment of acute lymphoblastic leukemia (the most common type of cancer among children), and in food industry for the acrylamide reduction of heated starch-rich foods. Considering the importance of these applications, the improvement of this enzyme's properties is in high demand. Immobilized ASNase brings many advantages for both food and pharmaceutical industries since an easier recovery and reuse is achieved, together with an enhanced stability and half-life time. Moreover, for the therapeutic sector, the immobilization can reduce side effects caused in patients during the free-enzyme administration. Carbon xerogels (CXs) are new and promising materials for the immobilization of ASNase due to their high surface area and adsorption capacity, and to the possibility to precisely tailor their porosity by adjusting the synthesis conditions. In this work, the influence of the contact time, pH, and enzyme concentration on the immobilization yield and relative recovered activity of the immobilized ASNase was studied using the Central Composite Design methodology. The results obtained revealed the important influence of the enzyme concentration on the immobilization process proving the potential of CXs as a support for ASNase. CXs with different pore dimensions (ranging from 4 to 30 nm) were tested. The most promising results were obtained using de CX with an average pore size of 4 nm, resulting in immobilization yields of 100% and relative recovered activities above 100%. These results are considered a step forward towards the search for a simple and cost-effective ASNase immobilization process for subsequent use in the therapeutic and food sectors.

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Authors and affiliations

Miss R. A. M. Barros (Presenting)

Laboratory of Separation and Reaction Engineering - Laboratory of Catalysis and Materials (LSRE-LCM), Department of Chemical Engineering, Faculty of Engineering, University of Porto, Portugal

Portugal
LAQV-REQUIMTE, Department of Chemistry, NOVA School of Science and Technology,
Universidade NOVA de Lisboa, Portugal

Dr M. G. Freire

CICECO-Aveiro Institute of Materials, Department of Chemistry, University of Aveiro, Portugal

Dr J. L. Faria

Laboratory of Separation and Reaction Engineering - Laboratory of Catalysis and Materials (LSRE-LCM), Department of Chemical Engineering, Faculty of Engineering, University of Porto, Portugal

Dr V. C. Santos-Ebinuma

Department of Engineering Bioprocess and Biotechnology, School of Pharmaceutical Sciences, UNESP-University Estadual Paulista, Brazil

Dr A. P. M. Tavares

CICECO-Aveiro Institute of Materials, Department of Chemistry, University of Aveiro, Portugal

Dr C. G. Silva

Laboratory of Separation and Reaction Engineering - Laboratory of Catalysis and Materials (LSRE-LCM), Department of Chemical Engineering, Faculty of Engineering, University of Porto, Portugal

Dr R. O. Cristóvão

Laboratory of Separation and Reaction Engineering - Laboratory of Catalysis and Materials (LSRE-LCM), Department of Chemical Engineering, Faculty of Engineering, University of Porto, Portugal

Presenter Email

up201604653@fe.up.pt

Gender

Woman

Categories

Other

Other theme

Biotechnology

Keyword1

L-asparaginase

Enzyme immobilization

Keyword3

Carbon xerogel

Keyword4

Central Composite Design

Presentation

Oral

AV requirements

Video

Computer projection

Mac used

Registration

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