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Ethanol production in bioreactor assisted by electromagnetic field: Kinetic modeling

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Bioelectromagnetism is a relative new area that can be applied to several biotechnology processes like as biofuels production by unconventional route. In this context, investigations about bioethanol production in bioreactor assisted by Extremely Low Frequency Electromagnetic Fields have been carried out seeking to increase the fermentative process yields. Therefore, to optimize the unconventional bioreactor operation conditions, the modeling of these systems is required. Thus, in this work the kinetic modeling of a batch fermentation process to ethanol production from sugar cane molasses by Saccharomyces cerevisiae using a bioreactor assisted by electromagnetic field was carried out. Three different types of kinetic models including product inhibition effects on the yeast growth were considered to adjust the experimental data. Then, comparatively the hyperbolic model was the best option. However the most important challenges are to verify if electromagnetic field change the ethanol tolerance by the cells and consequently to develop a hybrid mathematical kinetic expression of the cell growth and metabolite production (ethanol) as function of electromagnetic flux density parameter.

Biography

Manuel G Mendoza Turizo is an MSc Student in the Natural Science Graduate Program of the State University of Northern of Rio de Janeiro, Rio de Janeiro, Brazil. He earned his degree in Chemical Engineering in 2014 with honors in the University of Cartagena. Actually he works in the biofuels production area by unconventional methods and fermentation process modelling.

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