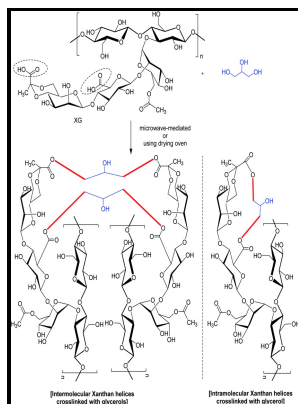# Approaches to modelling the xanthan fermentation

University of Birmingham - CN101639432A

Description: -

-Approaches to modelling the xanthan fermentation

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Modeling and steady state simulation: production of xanthan gum from sugarcane broth

Gilani SL, Najafpour GD, Heydarzadeh HD, Zare H 2011 Kinetic models for xanthan gum production using Xanthomonas campestris from molasses. The detection of biomass is mainly by being nephelometry in the xanthan gum fermentation process. Silva MF, Fornari RCG, Mazutti MA, Oliveira D, Padilha FF, Cichoski AJ, Cansian RL, Di Luccio M, Treichel H 2009 Production and characterization of xanthan gum by Xanthomonas campestris using cheese whey as sole carbon source.

Modeling and steady state simulation: production of xanthan gum from sugarcane broth

It is desirable that a fermentation model includes an accurate representation of biomass growth, product formation, and substrate consumption.

Development of Kinetic Model for Xanthan Production in a Laboratory

J Food Eng 90 1 :119—123. The process assumes a dilute acid 0. Letisse F, Lindley ND, Roux G 2003 Development of a phenomenological modeling approach for prediction of growth and xanthan gum production using Xanthomonas campestris.

Fermentation Model

The aim is a broth substantially free of insoluble matter having a particle size above 3 microns. An initial solution seed value must be given for the set of decision variables for starting the optimization. Xanthan gum estimation Biomass and xanthan gum estimation were performed after withdrawing the sample, for biomass estimation 5 mL sample was centrifuged at 12,000 rpm for 10 min, then supernatant is decanted and cell pellet is dried in hot air oven at 100 °C and then weighed.

Hybrid modeling of xanthan gum bioproduction in batch bioreactor

The first-stage inoculum reactor, seeded with immobilized fecal microbiota, is used to continuously inoculate a set of parallel second-stage reactors.

Modeling and steady state simulation: production of xanthan gum from sugarcane broth

As an example, a frequently-used mathematical model for batch fermentation consists of the Monod equation for growth and an expression for rate of substrate consumption as a function of biomass concentration: 13. The E 540 and cell dry weight decreased, resulting in a lower TPM but not affecting the polymer:cell ratio significantly. The hybrid modeling of the process provided a satisfactory fitting quality of the experimental data, since this approach makes possible the incorporation of the effects of operational variables on model parameters.

Optimal control of a batch bioreactor for the production of xanthan gum

The papers were dried to constant weight either in a vacuum oven at 45° C for 24 hours or under an infra-red lamp, then reweighed to give a total precipitate matter TPM determination. Chem Ind Chem Eng Q 17 2 :179—187. Several methods have been developed to increase the yield and properties of xanthan gum using various carbon sources Silva et al.

Fermentation Model

When models are used for fermentation control, they are usually based on mass-and energy-balance equations for the system. Feed savings as great as 17% were reported, which eventually provided a basis of the 1996 National Recommendations for Beef Cattle.

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