

Effect of mass transfer and characterisation of aeration & agitation in xanthan gum production using oxygen vector

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Oxygen mass transfer represents the most important parameter involved in the design and operation of mixing-sparging equipment in bioreactors. It can be described and analyzed by means of the mass transfer coefficient, kLa . The kLa values are affected by many factors such as geometrical and operational characteristics of the vessels, microorganism morphology, biocatalysts properties, composition, type & concentration of media.

Oxygen mass transfer rate have been studied during xanthan gum production process in stirred tank bioreactor. The volumetric mass transfer coefficient, kLa , has been measured by dynamic technique in solution of xanthan gum for a wide interval of operational condition. This coefficient has been determined changing many variables such as air flow rate, agitation speed, and superficial velocity. The efficiency of oxygen transfer could be enhanced by adding oxygen-vectors in broths, such as hydrocarbons or fluorocarbons, without increasing the energy consumption for mixing or aeration. The work was aimed at investigating the mass transfer effects of xanthan gum production by using oxygen vectors from *Xanthomonas campestris*. Since the solubility of oxygen is very low in fermentation broth, it becomes a growth-limiting substrate for xanthan gum production. The use of oxygen vectors will enhance the oxygen solubility should necessarily increase the kLa and hence oxygen transfer rate (OTR). In this work, the effect of oxygen vector n-dodecane on the xanthan gum production was compared with that of control without oxygen vector. Experimental results obtained for simulated broths indicated a considerable increase of kLa in the presence of n-dodecane, and the existence of a certain value of n-dodecane concentration that corresponds to a maximum mass transfer rate of oxygen

Biography

R. Sivashankar is doing Ph.D in Dept. of Chemical Engineering at NIT, Calicut. He has published 2 papers in the International journals. He has participated and presented in more than 13 International and National conferences. His research interest is in the area of Degradation, Immobilization and Bio-Nanoparticle analysis.

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