CORRELATION BETWEEN AERATION AND ERGOSTEROL PRODUCTION BY YEASTS

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Abstract

The present study represents an extension of ergosterol production by Saccharomyces cerevisiae fermentation processes using oxygen-vector by establishing the influence of the analyzed main factors, such as aeration efficiency and hydrocarbon concentration. The study has been developed for batch and fed-batch fermentation systems and has been focused on the variation of ergosterol content inside the yeast cells during the fermentation cycle in correlation with hydrocarbon volumetric fraction, COV, glucose concentration, CG, and air superficial velocity, vS. Moreover, the variation of ergosterol content has been discussed in relation to the oxygen mass transfer coefficient, kLa. The experimental results obtained in both fermentation systems were quantified in two mathematical correlations describing the influences of the mentioned main parameters on ergosterol concentration, CE. These two equations have the general expression $CE = a \cdot COV^x \cdot CG^y \cdot vS^z$ ($a$, $b$, $y$, $\delta$ are coefficients and exponents), and offer a good agreement with the experiments, the average deviations being ±5.94% for batch fermentation and ±4.18% for fed-batch fermentation.

Key words: air superficial velocity, ergosterol, n-dodecane, oxygen-vector, Saccharomyces cerevisiae.

Received: September, 2019; Revised final: November, 2019; Accepted: December, 2019; Published in final edited form: December, 2019

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