

The $K_L a$ influence on ethanol production by *Pichia stipitis*J.P.A. Silva¹, S.I. Mussatto^{*2}, I.C. Roberto¹ and J.A. Teixeira²

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Nowadays, there is a great interest in the development of technologies for ethanol production as an alternative combustible, since it can be used instead of petrol or to blend with petrol, reducing the country's dependence on oil and imported fuel. It is known that the ethanol production by fermentation is influenced by several process conditions such as pH, temperature, medium composition, oxygen availability, among others. Determining the most suitable fermentation conditions is of large importance for the establishment of a successful technology. In the present work, the influence of oxygen transfer volumetric rate ($K_L a$) on xylose to ethanol bioconversion by the yeast *Pichia stipitis* NRRL Y-7124 was evaluated using a semi-defined fermentation medium containing 90 g/l xylose. The assays were carried out in a bioreactor at 30°C, under different aeration conditions (0.5, 1.0, and 1.5 vvm) and stirring rates (200, 300 and 400 rpm) which resulted in $K_L a$ values of 2.3, 18.7 and 65.8 h⁻¹ respectively. According to the results, the bioconversion was dependent on the aeration rate employed, the highest ethanol production (27.1 g/l) being achieved when using a $K_L a$ of 2.3 h⁻¹. The increase of this parameter to 18.7 and 65.8 h⁻¹ promoted decreases of 52% and 100% on ethanol production, respectively. By using a $K_L a$ of 65.8 h⁻¹ the ethanol production was totally deviated to biomass production. Such results are of interest for the development of a suitable technology for ethanol production by *Pichia stipitis*.