FIT OF EXPERIMENTAL DATA OBTAINED ON THE ETHANOL PRODUCTION BY FERMENTATION WITH *Saccharomyces cerevisiae* USING THE GAUSS-NEWTON METHOD.

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This work focused the parameters determination of batch ethanol production process employing the kinetic model of Monod. The parameters of this model were obtained fitting the curves to the data by the Gauss-Newton method. This method uses an expansion in Taylor series to approximate the model with non-linear regression with linear terms, applying minimum squares to estimate the parameters. The aim of this work was elaborate a computational program made in Fortran language using the Gauss-Newton method with objective modeling experimental data of ethanol produced by fermentation, evaluating the convergence of this method varying the initial estimation and the admitted tolerance. The data were modeled with a non-linear equation that matches the microorganism growth velocity with the substrate consumption, with two parameters to be optimized, $\mu_{\text{max}}$ and $k_s$. The execution of the program was done with different inputs of admitted tolerance, $10^{-1}$, $10^{-3}$, $10^{-10}$ e $10^{-12}$. In general it was observed that there was convergence when using inputs of admitted tolerance up to $10^{-6}$. The Gauss-Newton method to the fit of experimental data is considered efficient for optimizing the parameters, converging with low number of iterations.