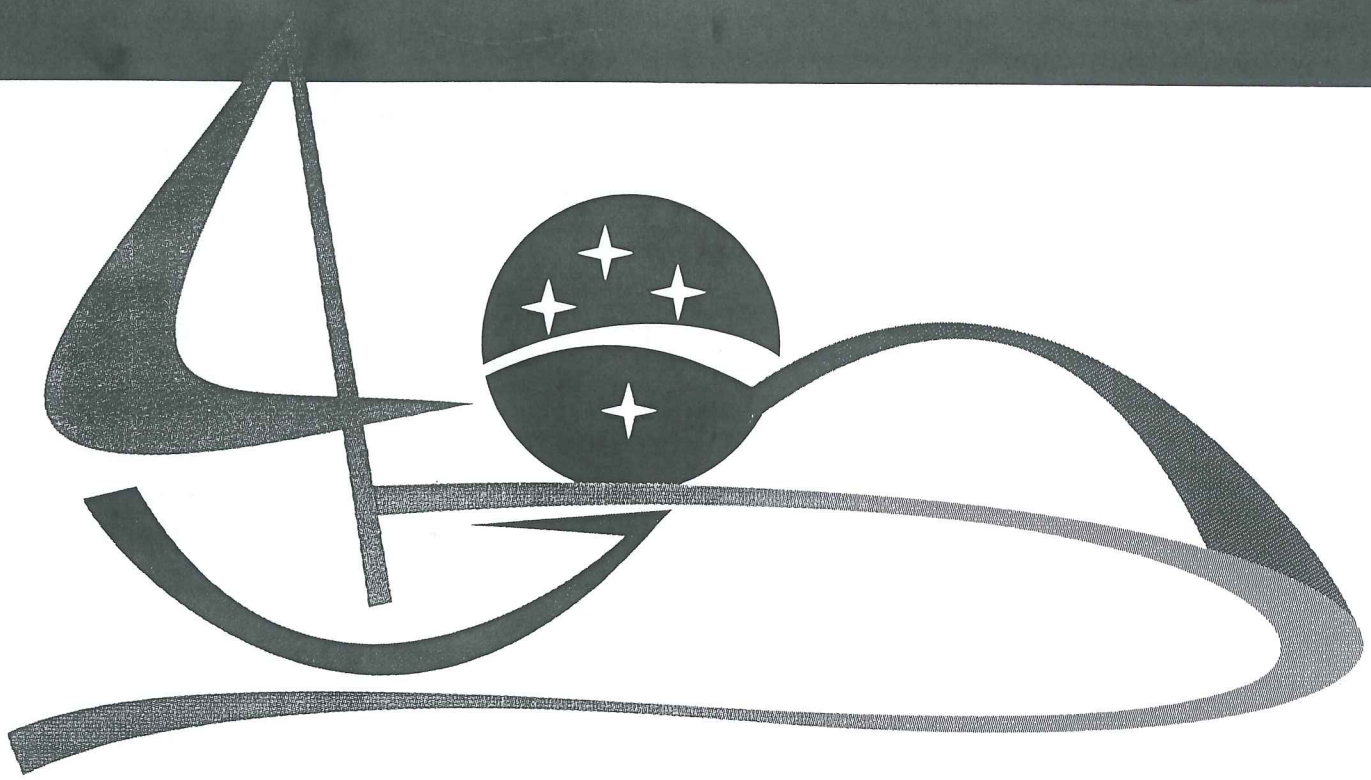
ABSTRACTS

ENPROMER 2005



2nd Mercosur Congress on Chemical Engineering

4th Mercosur Congress on Process Systems Engineering

August 14th to 18th, 2005

Village Rio das Pedras – Club Med, Rio de Janeiro, Brazil

C6-O-1 Day 16th 05:20 PM Room: D.Miguel

MODELLING THE KINETICS OF THERMAL INACTIVATION OF APPLE POLYPHENOLOXIDASE

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The enzymatic browning of fruits and vegetables caused by mechanical injury during post-harvest storage or processing is initiated by the catalytic action of polyphenoloxidase (PPO). A blanching treatment prior to processing is still considered mostly effective in inhibiting the catalytic activity of PPO, and thus controlling undesirable enzymatic browning. In this work, different mathematical routines were assessed in terms of their adequacy to describe the thermal inactivation of PPO from Golden apples over a range of temperatures from 62.5 to 72.5 °C. The classical approach to kinetic modelling of the decay activity of apple PPO, commonly reported to follow a first-order model, employs a two-step procedure, in which the model parameters are individually obtained, by each temperature studied, using non-linear or linear regressions. Thereafter, the estimated parameters are further used to calculate their temperature dependence. Alternatively, a one-step method provides a regression fit to all experimental data sets, with the temperature dependence equation being directly built in the kinetic model. This fitting technique thus (a) avoids the estimation of intermediate parameters and (b) substantially increases the degrees of freedom and hence the precision of parameters' estimates. Within this issue was further explored the logarithmic transformation of the mathematical equations used on the adequacy of the model to describe experimental data. In all cases non-weighted least-squares regression procedures were used. Both the examination and criticism of the current modelling strategies were done by assessing statistical data obtained, such as the confidence intervals of the estimates, correlation coefficients, sum of squares, and residuals normality.