A COMPARATIVE STUDY OF KINETIC IMMOBILIZED YEAST PARAMETERS IN BATCH FERMENTATION PROCESSES

Terkida Prifti (Vaso)
Faculty of Natural Sciences,
University of Tirana, Tirana,
ALBANIA

Luljeta Pinguli
Faculty of Natural Sciences,
University of Tirana, Tirana,
ALBANIA

Ilirjan Malollari
Faculty of Natural Sciences,
University of Tirana, Tirana,
ALBANIA

ABSTRACT

The rate of biochemical reactions in immobilized cell systems usually is lower compared to free cell fermentation. Kinetic parameters modified resulting in different mathematical models, productivity and rate. This paper is focused in kinetic parameters study (μ_{max}, K_s, K_i) of immobilized yeast cells in alginate matrix compared to free yeast cells parameters in batch fermentation processes. Using different beads diameters, cell density, including substrate and product inhibition conditions. We have evaluated kinetic parameters with three different linearization methods and mathematical models that fits with experimental results. At non – inhibitory conditions immobilized yeast ferment similiary to free yeast for small bead diameters. Due to bead diffusion resistance the differences compared to free yeast system are notable with beads size increase. In inhibitory condition, productvity and reaction rate are higher compared to free yeast fermentation. This is linear with beads size increasing.

Keywords: Immobilized yeast, kinetic parameters, linearization, inhibition constant.