

Abstract

A method of protecting immobilized cells against inhibitory substances in the fermentation medium was investigated with the aim of developing a process for fermentation under unsterile conditions. It was found that yeast cells could be protected against the inhibitory effects of p-hydroxybenzoic acid esters by co-immobilizing the cells with vegetable oils. In such a system, the cells grow only in the water phase of the gel beads where most components of the fermentation medium are retained. On the other hand, the p-hydroxybenzoate that diffuses into the gel beads is retained mainly in the oil phase of the beads. Consequently, the p-hydroxybenzoate concentration in the water phase remains too low to inhibit the metabolic activities of the immobilized cells. The effectiveness of a vegetable oil in protecting the immobilized cells against an inhibitory substance depends on the partition coefficient of the substance between the oil and water, the concentration of the oil and the initial cell concentration.

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