

환경독성

Enhanced Expression of α -amylase by Adding Nitrogen Source in the Culture of methylotrophic yeast in air-lift bioreactor

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Abstract

For high level expression of foreign protein in the methylotrophic yeast, *Pichia pastoris*, the optimizations were carried out. The maximum α -amylase activity at 28 °C was obtained, 280 U/ml. When the mixture of 20g/l of peptone and 20g/l of yeast extract was used, the α -amylase activity was 300 U/ml. When the cultures were carried out at the range of pH 5 to 7 in a jar fermentor, the cell concentrations were a range of OD 68 to 72. However, at pH 6.0, the maximum α -amylase activity gave, 415 U/ml.

Among the various mixture ratios of methanol to glycerol, the cell growth and the methanol consumption were increased with the increase of glycerol ratio in the continuous fed culture. However, when the mixture ratio of 1: 0.5 of methanol to glycerol was used, the maximum α -amylase activity was obtained, 1140 U/ml and the viable cell concentration was 9.8×10^{11} cells/ml. Using optimum culture conditions, the high cell density cultures for the high level expression of α -amylase were carried out in air lift bioreactor and jar fermentor with and without the addition of 20 g/l of yeast extract and 20g/l of peptone. The α -amylase activity after 7 days of culture was 2400 U/ml, which was about 2.1 fold higher than that of the addition without the mixture nitrogen source.