

Fermentative production of succinic acid by *Actinobacillus succinogenes* sp. 130Z

김문일, Shang Longan, 장용근, 장호남
한국과학기술원 생명화학공학과
전화 (042) 869-3952, FAX (042) 869-8800

Several factors which affect cell growth and succinic acid production were examined by batch cultures. Cells grew continuously for about 15 hours after inoculation at different initial glucose concentration with 5 g/L yeast extract. However, after 15-20 hours from inoculation, cell growth curve declined abruptly though remained glucose was continuously consumed for succinic acid production. When cells grew in a medium containing 20 g/L glucose, final succinic acid concentration was about 13 g/L and maximum cell densities reached were OD₆₆₀ of 3.04. When 40 g/L glucose was used, cells grew up to an OD₆₆₀ of 3.22 and did not grow further. Final succinic acid concentration approached 30 g/L. At an initial glucose concentration of 60 g/L, cells grew to an OD₆₆₀ of 3.5, and then were lysed. Final succinic acid concentration obtained with 60 g/L glucose was 32 g/L. The distribution of fermentation products was not affected by initial glucose concentration, and the ratios of fermentation products (g-succinic acid : g-acetic acid : g-formic acid) were 3.5 : 1 : 1.

In order to make cells grow continuously even in high glucose concentration during the culture period, effect of high concentration of yeast extract was examined in a medium containing 60 g/L glucose and 25 g/L yeast extract. When 60 g/L glucose and 5 g/L yeast extract were used, cells grew to an OD₆₆₀ of 3.5 and the productivity was 0.462 g/L/h. Interestingly, when 60 g/L glucose and 25 g/L yeast extract were used, cells grew to an OD₆₆₀ of 9.1 and the succinic acid productivity reached 1.39 g/L/h. Therefore, in a medium containing high glucose concentration, more yeast extract was needed to achieve high cell concentration and productivity.

References

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