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RESEARCH NOTES

Ralstonia eutropha批式流加培养生产羟基丁酸-丙酸混合聚酯中丙酸进料优化研究

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摘要 The feeding method of propionic acid for production of poly(3-hydroxybutyrate-co-3-hydro
xyvalerate) [P(3HB-co-3HV)] by fed-batch culture of Ralstonia eutropha was optimized to achieve high cell density and high 3HV yield. Effects of different feeding strategies of propionic acid on the production of P(3HB-co-3HV) were investigated. A decline of specific synthesis rate of copolymer and the yield of 3HV unit from propionic acid were observed due to the propionic acid accumulation in culture broth when the feeding solution with high P/G(propionic acid to glucose) ratio was employed. It was further confirmed by controlling propionic acid concentration at a low level in the separate feeding of propionic acid. An optimal feeding strategy was demonstrated to reduce the propionic acid accumulation. The cell concentration, P(3HB-co-3HV) productivity and 3HV unit fraction reached to 163.9 kg.m-3,1.8 kg.m-3.h-1, and 10.6%(by mass), respectively, resulting in a yield of 0.33 g HV per g propionic acid.

关键词 biodegradable polyester feeding strategy P(3HB-co-3HV) propionic acid Ralstonia eutropha

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ptimization of Propionic Acid Feeding for Production of Poly (3- hydroxybutyrat e- co- 3- hydroxyvalerat e) in Fed-Batch Culture of Ralstonia eutropha

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Abstract The feeding method of propionic acid for production of poly(3-hydroxybutyrate-co-3-hydro xyvalerate) [P(3HB-co-3HV)] by fed-batch culture of Ralstonia eutropha was optimized to achieve high cell density and high 3HV yield. Effects of different feeding strategies of propionic acid on the production of P(3HB-co-3HV) were investigated. A decline of specific synthesis rate of copolymer and the yield of 3HV unit from propionic acid were observed due to the propionic acid accumulation in culture broth when the feeding solution with high P/G(propionic acid to glucose) ratio was employed. It was further confirmed by controlling propionic acid concentration at a low level in the separate feeding of propionic acid. An optimal feeding strategy was demonstrated to reduce the propionic acid accumulation. The cell concentration, P(3HB-co-3HV) productivity and 3HV unit fraction reached to 163.9 kg.m-3,1.8 kg.m-3.h-1, and 10.6%(by mass), respectively, resulting in a yield of 0.33 g HV per g propionic acid.

Key words biodegradable polyester; feeding strategy; P(3HB-co-3HV); propionic acid; Ralstonia eutropha

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