中国化学工程学报 2000 8 (1): 46-51 ISSN: 1004-616x CN: 44-1063/R

RESEARCH PAPERS

5mmminipage15cm A Morphologically Structured Model for Mycelial Growth andSecondary Metabolite Formation

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收稿日期 修回日期 网络版发布日期 接受日期

摘要 A morphologically structured model is proposed todescribe the batch fermentation of lovastatin according to the growthkinetics of filamentous microorganisms. Three kinds of hyphae areconsidered in the model: actively growing hyphae, non-growing hyphae anddeactivated hyphae. Furthermore, actively growing hyphae consist ofthree morphological compartments: apical compartment which gives rise tohyphal tip extension; subapical compartment which is related to hyphalbranching; and hyphal compartment which is only responsible forsecondary metabolite formation. The kinetics of mycelial growthmechanism issummarized and applied in modeling lovastatin fermentation. AMichaelis-Menten kinetic model with substrate inhibition is proposed forproduct formation. As expected, the model simulations fit well withexperimental data obtained either from a laboratory scale 10 Lfermenter or from a pilot-plant scale fermenter.

关键词 lovastatin Aspergillus terreus filamentousmicroorganism morphologically structured model kinetics

分类号

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Received Revised Online Accepted

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Key words lovastatin; Aspergillus terreus; filamentousmicroorganism; morphologically structured model; kinetics

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