

生物化学工程、制药、食品和天然产物加工

## 蛋白质的膨胀床吸附过程穿透模型分析

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收稿日期 2003-3-31 修回日期 2003-12-22 网络版发布日期 2008-9-1 接受日期

摘要

关键词 [蛋白质](#) [穿透模型](#) [膨胀床](#) [吸附](#) [模拟](#)

分类号

## ANALYSIS OF BREAKTHROUGH MODEL FOR EXPANDED BED ADSORPTION OF PROTEIN

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### Abstract

Using the fundamental adsorption equilibrium and kinetic parameters obtained from batch experiments, the mass transport and hydrodynamic behavior in the expanded bed of DEAE Sphero-dex M was analyzed with the breakthrough model. The results showed that the effect of particle size on breakthrough behavior was obviously greater than that of other parameters. The change of the time of 5% breakthrough, with increasing and decreasing mean particle diameter by a factor of 2, reached about 40% relative to that with the mean diameter, 88  $\mu\text{m}$ . Secondary effects on expanded bed adsorption were film mass transfer and pore diffusion (<10%). Axial dispersion in solid phase had almost negligible effect on the adsorption process. Therefore, the assumption of even dispersion of adsorbent within the expanded bed may result in the model discrepancy to a great extent. It is considered that the breakthrough model can be further improved by taking into account particle size distribution in the expanded bed.

**Key words** [protein](#) [breakthrough model](#) [expanded bed](#) [adsorption](#) [simulation](#)

DOI:

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