

An integrated bioreactor-expanded bed adsorption system for the removal of acetate to enhance the production of alpha-interferon-2b by Escherichia coli

ABSTRACT

A stirred tank bioreactor (STB) integrated with an expanded bed adsorption (EBA) system containing anion-exchange resin (Diaion WA30) was developed for in situ removal of acetate to increase the production of α -interferon-2b (α -PrIFN-2b) by Escherichia coli (E. coli). Although the total acetate (9.79 g/L) secreted by E. coli in the integrated STB/EBA system was higher than that in a bioreactor with dispersed resin or a conventional batch bioreactor, cell growth (14.97 g/L) and α -PrIFN-2b production (867.4 g/L) were significantly improved owing to the high efficiency of acetate removal from the culture. The production of α -PrIFN-2b in the integrated STB/EBA system was improved by 3-fold and 1.4-fold over that obtained in a conventional batch bioreactor and a bioreactor containing dispersed resins, respectively.

Keyword: Bioreactors; Expanded bed adsorption; Fermentation; Acetic acid; α -Interferon-2b