link.springer.com/chapter/10.1007%2F978-94-009-0783-6_5#page-2

Page 1

38

THE EFFECT OF CULTURE HISTORY ON THE DISRUPTION OF *ALCALIGENES EUTROPHUS* BY HIGH PRESSURE HOMOGENISATION

SUSAN T. HARRISON, JOHN S. DENNIS[†] and HOWARD A. CHASE,
Department of Chemical Engineering, University of Cambridge,
Pembroke St., Cambridge, CB2 3RA.
[†]Consultant Chemical Engineer, 20 Church Lane, Dullingham,
Newmarket, Suffolk, CB8 5DX

ABSTRACT

To date, rigorous study of the use of high pressure homogenisation in cell rupture over a wide range of operating conditions has been confined to the yeasts. This investigation concentrates on the rupture of the Gram-negative bacterium *Alcaligenes eutrophus* by an industrial homogeniser. The parameters affecting cell disruption such as operating pressure, temperature and biomass concentration as well as the effect of cell characteristics such as growth rate, size, shape and wall strength were studied. Bacterial cultures which are growing rapidly in the logarithmic phase exhibit less resistance to rupture than nutrient limited cultures in the stationary phase. This is accompanied by a decreased dependence of the degree of cell rupture on operating pressure with increased culture age. The extent of accumulation of the storage product poly-β-hydroxybutyrate during stationary phase has a less significant effect on the resistance to cell rupture than the growth phase of the micro-organism. This is particularly interesting owing to the concomitant change in the shape and size of the bacterium on the accumulation of storage product. A variety of chemical and physical treatments of the stationary phase micro-organisms prior to rupture have been considered in an attempt to decrease cell wall strength. Cell rupture efficiency is increased by any of the following pretreatments: incubation at 45°C, alkaline pH shock, addition of the detergent sodium dodecyl sulphate or addition of sodium chloride.

proposal mweni (1).doc proposal mweni.doc Resear: proposa%...do... C:\3a\5c\user%5ca...pdf Resear: proposa%...do... LS020W+The+rese...doc LS020W+The+rese...doc Show all downloads

3:21 PM
8/16/2016