

C717967 : MAJOR CHEMICAL ENGINEERING

KEY WORD: PHB / ROTATING MICROFILTRATION

JANTAPORN POONNARATANAKUL : SEPARATION OF Alcaligenes eutrophus ATCC 17697 CELLS CONTAINING POLY- β -HYDROXYBUTYRATE FROM FERMENTATION BROTH BY A ROTATING CYLINDRICAL MICROFILTER. THESIS ADVISOR : ASSOC. PROF. CHIRAKARN MUANGNAPOH, Dr. Ing. 229 pp. ISBN 974-636-732-3.

In this work, the effects of feed concentrations (2, 7, 10 g/l), the rotational speed of the ceramic membrane (0, 500, 900, 1200, 1500 rpm), and filtration pressures (17, 34, 44.2 and 51 kPa) on filtration were studied by using rotating filter for separating Alcaligenes eutrophus ATCC 17697 from fermentation broth. The gap between the membrane wall and the inside wall of tube is 7.25 mm. The experiments were carried out with the flowrate of fermentation broth of 0.013 cubic meter per hour. It was found that the increase in concentration of feed solution enhanced the filtration resistance due to higher membrane clogging, but the permeation flux was reduced. However, the permeation flux could be enhanced by increasing the rotational speed of the ceramic membrane, which enhanced the shear stress at the membrane surface resulting in sweeping the particles at the surface. As a result, the filtration resistance due to the membrane clogging was reduced. The increase in pressure for the non-rotating membrane system had a little effect on the permeation flux because of fast polarization. Whereas the rotating membrane filtration system could control the membrane clogging. It was also found that, for batch filtration, at the cell concentration of 2 g per litre, the rotational speed of 1500 rpm, and the pressure of 34 kPa, the cell concentration was enhanced three times within 90 minutes.

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