

## **Abstract**

High cell density cultivation of *Escherichia coli* on a glycerol-based mineral medium was studied. The cultivation was done in a dialysis reactor composed of two chambers. The inner chamber is formed and separated from an outer chamber by a membrane. Fresh medium was continuously exchanged with medium in the outer chamber so that both glycerol and other components of the medium were supplied to the inner chamber through the membrane. Inhibitory substances diffused from the inner to the outer chamber and were subsequently removed with effluent from the outer chamber. Initially, mathematical models were used to describe the process. The optimal cultivation parameters, such as the initial glycerol concentrations in the two chambers, the desired transport rate across the membrane, glycerol concentration in the feed/dialysing medium, and the time to start the medium exchange, were determined from preliminary experiments and calculations. The actual cultivation results agreed very well with the model predictions. A very high cell concentration of 174 g dry weight/l was obtained. This cell concentration is within the range of the maximum theoretical concentration of *E. coli* in culture broth (160-200 g/l).

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