

BIOREACTOR ENGINEERING

Chapter 2

Culture Kinetic Study of Batch Fermentation

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Exercise 1

Monoclonal antibody is produced under batch operation and the cell concentration at different times are measured.

- Calculate the specific growth rate at the log phase.
- Calculate the doubling time.

t (days)	C (cell/mL)
0.0	4.50×10^5
0.2	5.20×10^5
0.5	6.50×10^5
1.0	8.10×10^5
1.5	1.22×10^6
2.0	1.77×10^6
2.5	2.13×10^6
3.0	3.55×10^6
3.5	4.02×10^6
4.0	3.77×10^6
4.5	2.20×10^6



Exercise 2

The specific death constant of *Bacillus subtilis* at 100°C is 0.23 min⁻¹. To kill 99% of spores in the sample, calculate the required time.

