



# PROCESS ECONOMICS PROGRAM

SRI INTERNATIONAL

Menlo Park, California

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## Abstract

Process Economics Program Report No. 188

BIOTECHNOLOGY REACTION SYSTEMS

(March 1987)

Most bioreactions are carried out in dilute aqueous media and are catalyzed by enzymes produced by microorganisms. This report examines the engineering parameters and the design and scale-up of various bioreactors, including those that are used commercially and some of those that have been evaluated at the research and development stage.

This report also reviews the mechanisms and kinetics of bioreactions, the technologies of medium and air sterilizations, and contains cost correlations for selected equipment.

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# **BIOTECHNOLOGY REACTION SYSTEMS**

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**March 1987**

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**PROCESS ECONOMICS PROGRAM**

Menlo Park, California 94025

For detailed marketing data and information, the reader is referred to one of the SRI programs specializing in marketing research. The CHEMICAL ECONOMICS HANDBOOK Program covers most major chemicals and chemical products produced in the United States and the WORLD PETROCHEMICALS Program covers major hydrocarbons and their derivatives on a worldwide basis. In addition, the SRI DIRECTORY OF CHEMICAL PRODUCERS services provide detailed lists of chemical producers by company, product, and plant for the United States and Western Europe.

## CONTENTS

1	INTRODUCTION . . . . .	1
2	SUMMARY . . . . .	3
	Sterilization . . . . .	3
	Mechanical Agitation . . . . .	4
	Aeration . . . . .	5
	Mass Transfer . . . . .	5
	Heat Transfer . . . . .	6
	Bioreactor Scale-Up . . . . .	7
	Stirred Tank Bioreactors . . . . .	8
	Bubble Column and Airlift Bioreactors . . . . .	10
	Immobilized Microbial Cell/Enzyme Bioreactors . . . . .	11
	Jet-Loop Bioreactors . . . . .	13
	Other Bioreactors . . . . .	13
	Equipment Costs . . . . .	14
3	BIOREACTION MECHANISMS AND KINETICS . . . . .	15
	Microbial Growth . . . . .	15
	Enzyme-Catalyzed Bioreactions . . . . .	18
	Mechanisms . . . . .	19
	Kinetics . . . . .	20
	Application of Kinetics . . . . .	32
4	DESIGN AND SCALE-UP FOR STERILIZATION . . . . .	33
	Medium Sterilization . . . . .	33
	Kinetics . . . . .	33
	Critical Considerations . . . . .	35
	Batch Sterilization by Steam . . . . .	36
	Continuous Sterilization . . . . .	37
	Other Processes . . . . .	40
	Comparison of Batch and Continuous Steam Sterilization . . . . .	40
	Scale-Up of Heat Sterilization Processes . . . . .	41
	Air Sterilization . . . . .	43
	Mechanisms . . . . .	44
	Fibrous Filters . . . . .	45
	Membrane Filters . . . . .	46
	Filter Design . . . . .	47
	Filter Performance . . . . .	49
	Exhaust Gas Sterilization . . . . .	50

## CONTENTS

5	MECHANICAL AGITATION AND AERATION . . . . .	51
	Mixing . . . . .	51
	Mechanical Agitation . . . . .	52
	Aeration . . . . .	52
6	MASS TRANSFER . . . . .	57
	Oxygen Requirement . . . . .	57
	Oxygen Transfer Rate . . . . .	59
7	HEAT TRANSFER . . . . .	63
	Heat Input for Medium Sterilization . . . . .	63
	Heat from Microbial Metabolic Activities . . . . .	64
	Heat from Mechanical Agitation or Aeration . . . . .	64
	Heat Losses . . . . .	65
	Heat Removed . . . . .	65
	Heat Transfer Methods . . . . .	67
	Design Considerations . . . . .	68
8	SCALE-UP . . . . .	71
	Geometric Similarity . . . . .	72
	Constant Volumetric Mass Transfer Coefficient . . . . .	72
	Constant Power Input per Unit Volume . . . . .	73
	Equal Mixing Time . . . . .	76
	Constant Impeller Tip Speed . . . . .	77
	Other Considerations . . . . .	77
	Typical Procedures . . . . .	78
9	BIOREACTORS . . . . .	81
	Conventional Stirred Tank Bioreactors . . . . .	81
	Advantages . . . . .	81
	Limitations . . . . .	82
	Uses . . . . .	82
	Typical Designs . . . . .	83
	Mechanical Agitators . . . . .	86
	Power Input of Mechanical Agitators . . . . .	91
	Other Accessory Equipment . . . . .	98
	Mass Transfer . . . . .	99
	Modified Stirred Tank Bioreactors . . . . .	105
	Stirred Tank Bioreactors with an Internal Draft Tube . . . . .	105
	Self-Priming (self-aspirating) Stirred Tank Bioreactors . . . . .	106

## CONTENTS

<b>9</b>	<b>BIOREACTORS (continued)</b>	
	Stirred Tank Bioreactors with a Multiple of Impellers Enclosed in a Multistage Draft Tube . . . . .	107
	Other Stirred Tank Bioreactors . . . . .	107
	Bubble Column and Airlift Bioreactors . . . . .	111
	Uses . . . . .	112
	Bubble Column Bioreactors . . . . .	113
	Airlift Bioreactors . . . . .	114
	Design Considerations . . . . .	119
	Multistage, Agitated Column Bioreactors . . . . .	130
	Immobilized Microbial Cell/Enzyme Bioreactors . . . . .	132
	Stirred Tank Bioreactors with an External Separator . . . . .	133
	Column Bioreactors . . . . .	133
	Film Bioreactors . . . . .	136
	Membrane Bioreactors . . . . .	137
	Jet-Loop Bioreactors . . . . .	143
	Plunging Jet Bioreactors . . . . .	143
	Deep Jet Bioreactors . . . . .	144
	Ejector-Loop Bioreactors . . . . .	145
	Fluidized Bed Bioreactors . . . . .	148
	Surface Culture Bioreactors . . . . .	150
	Rotating Disc and Drum Bioreactors . . . . .	151
	Torus Bioreactors . . . . .	152
<b>10</b>	<b>EQUIPMENT COSTS . . . . .</b>	<b>153</b>
	Stirred Tank Bioreactors . . . . .	153
	Continuous Steam Sterilizers for the Medium . . . . .	155
	Sterile Filters for Air and the Exhaust Gas . . . . .	155
	Column for Bioreactors . . . . .	155
	Cited References . . . . .	187
	Patent References . . . . .	201

## ILLUSTRATIONS

3.1	Graphical Determination of $K_M$ and $V_{MAX}$ in the Michaelis-Menten Equation . . . . .	23
3.2	Lineweaver-Burk Plots for Bioreactions with No Inhibition, with Competitive Reversible Inhibition, and with Noncompetitive Reversible Inhibition . . . . .	27
4.1	Effect of (heat) Sterilization Time and Temperature on DEL-Factor and Medium Quality . . . . .	42
9.1	A Typical Stirred Tank Bioreactor with Its Sterile Air, Exhaust Gas, Sampling and Product Lines . . . . .	85
9.2	Correlations of Gassed and Ungassed Mechanical Agitator Power Inputs for Various Agitators . . . . .	93
9.3	Nomograph of Power Consumption in a Stirred Tank Bioreactor . . . . .	95
9.4	A Self-Priming Stirred Tank Bioreactor Modified with an Internal Draft Tube . . . . .	108
9.5	A Frings Aerator for Self-Priming Stirred Tank Bioreactor . . . . .	109
9.6	Energy Requirement for Oxygen Transfer in Various Bioreactors . . . . .	115
10.1	Stirred Tank Bioreactors Equipment Costs . . . . .	154
10.2	Continuous Steam Sterilizers for the Medium Equipment Costs . . . . .	157
10.3	Sterile Filters for Air and the Exhaust Gas Equipment Costs . . . . .	158
10.4	Columns for Bioreactors Equipment Costs . . . . .	159

## TABLES

6.1	Typical Critical Oxygen Concentrations and Peak Oxygen Demands for Selected Microorganisms . . . . .	58
7.1	Typical Heat Balance for a Bioreactor . . . . .	66
9.1	Bioreactors Patent Summary . . . . .	163
9.2	A Typical Stirred Tank Bioreactor . . . . .	84
9.3	Volumetric Mass Transfer Coefficient, $k_L a$ , Correlations Reported for Stirred Tank Bioreactors . . .	103
9.4	Production Using Bubble Column and Airlift Bioreactors . .	112
9.5	Some Correlations of the Volumetric Mass Transfer Coefficient for Bubble Column and Airlift Bioreactors . .	124
9.6	Hollow Fiber Bioreactors Some Recent Studies . . . . .	138