



Contents

Preface	7
1. <i>Biological and biochemical principles</i>	9
1.1. Definition of enzymes	9
1.2. Structure and classification	10
1.3. Distribution in the intra- and extracellular space	12
1.4. Distribution of enzymes in organs	15
1.5. Enzyme variants	17
1.5.1. Isoenzymes	17
1.5.2. Heteroenzymes	20
1.5.3. Alloenzymes	20
1.6. Occurrence of enzymes in serum and urine	21
1.6.1. Origin of plasma enzymes	21
1.6.2. Release of cellular enzymes	22
1.6.3. Enzyme elimination	24
2. <i>The measurement of catalytic activity</i>	29
2.1. Fundamentals	29
2.1.1. Definition of catalytic activity	29
2.1.2. Complex formation and reaction equilibrium	29
2.1.3. Enzyme kinetics	30
2.2. Choice of method	41
2.2.1. Measurement of the reaction rate	42
2.2.2. Optimized methods	49
3. <i>Practical information</i>	51
3.1. Sampling and sample transport	51
3.2. Sample storage	54
3.3. Sources of error in measurement of catalytic activity	54
3.3.1. Insufficient substrate concentration	54
3.3.2. Other sources of error	55
3.3.3. Reagent stability	55
3.4. Evaluation of experimental results	56
3.4.1. Physico-chemical principles	57
3.4.2. Example	58
3.5. Quality control	59
4. <i>Bibliography</i>	63

5.	<i>Enzyme diagnosis in myocardial infarction</i>	64
5.1.	Different methods of examination used in myocardial infarction	64
5.2.	Infarction diagnosis by means of enzyme assays	64
5.2.1.	The CK/GOT ratio	68
5.2.2.	Differential diagnosis by means of CK isoenzymes	68
5.2.3.	Enzyme assays for monitoring the course of myocardial infarction – detection of possible complications	69
5.2.4.	Prognostic significance of enzyme determinations	72
5.2.5.	'Silent' myocardial infarction	73
5.3.	Other cardiac diseases accompanied by raised serum enzyme activities	73
5.4.	Differential diagnosis	74
5.5.	Lesions and diseases of skeletal muscle	75
5.6.	Bibliography	79
6.	<i>Enzyme diagnosis in hepatic disease</i>	81
6.1.	Diagnosis and differential diagnosis	81
6.2.	Information valuable for enzyme diagnosis	83
6.3.	Differentiation from other diseases	85
6.4.	Various liver diseases	86
6.4.1.	Acute viral hepatitis	86
6.4.2.	Toxic liver damage	88
6.4.3.	Chronic hepatitis	92
6.4.4.	Cirrhosis	95
6.4.5.	Biliary tract diseases and biliary cirrhosis	97
6.4.6.	Hepatic tumours	101
6.4.7.	Liver congestion from heart failure	102
6.4.8.	Functional hyperbilirubinaemia	102
6.5.	Bibliography	104
7.	<i>Enzyme diagnosis of pancreatic disease</i>	105
7.1.	Exocrine pancreatic function	105
7.2.	Diagnosis of pancreatic disease	105
7.2.1.	Acute pancreatitis	107
7.2.2.	Chronic pancreatitis	110
7.2.3.	Carcinoma of the pancreas	112
7.3.	Bibliography	114
8.	<i>Subject Index</i>	115
9.	<i>Appendix</i>	119
9.1.	Glossary of abbreviations	119
9.2.	Ratios	121
9.3.	Normal values for assays of enzyme activity in serum	123