

## Preface

During the last 20 years, there has been significant progress in the development of biotechnology and biochemical engineering. Much of the progress has been in anaerobic fermentations. The industrial importance of anaerobic fermentations in the production of food and beverages is well known and continuing. The expected future importance of anaerobic production of industrial chemicals and alcohol fuels has provided the incentive for continued research. The growth of the ethanol fermentation industry has been the motivation for many studies.

The purpose of this handbook is to bring together in one place much of the current knowledge on anaerobic fermentations. The emphasis is on the biotechnology and biochemical engineering associated with anaerobic fermentations. The contents have been ordered so that important topics such as kinetics, redox potential, membrane transport, bioenergetics, and reactor design are emphasized. The rationale for this approach is that descriptive treatments of each of the important anaerobic fermentations are available elsewhere.

The objective is to provide a book that is a useful reference for applied microbiologists, applied biochemists, biochemical engineers, and environmental engineers. The handbook is intended to be a reference book for professors and academic classes, as well as those involved in research, development, and design.

Each chapter is written to include references to the most important literature; however, a concise account of the important basic principles, methods, models, analyses, and results is included.

The intent is to provide a handbook that contains both important basic information and references where additional literature reviews and experimental and theoretical results are presented. The handbook should be an important addition to the personal library of those working in biotechnology and bioengineering.

Each chapter is written such that it can be understood by a scientist or engineer with a B.S. degree and a basic reading knowledge in biochemistry, microbiology, and biochemical engineering (equivalent to a good course in each).

The idea for a handbook on anaerobic fermentations should be credited to Dr. Maurits Dekker. The invitation to edit this work and his encouragement in the early stages of developing the scope and contents are appreciated. The early work to identify authors, develop chapter titles, and invite others to contribute was done while Dr. Erickson was on sabbatical leave at the University of California, Berkeley. The excellent library facilities and constructive suggestions received from many professional colleagues were very helpful.

The willingness of the authors to contribute and their efforts to help keep preparations for the book on schedule are appreciated. One of the goals of the editors was to have each chapter reviewed by at least one reviewer selected by the author of the chapter. We extend our thanks to all who contributed by helping with the review process.

Kansas State University provides an excellent environment for scholarly work. The encouragement of colleagues and administrators, the fine secretarial services, and other supporting services are appreciated. Financial support for our research from the National Science Foundation, Halliburton Education Foundation, U.S. Department of Agriculture, and the Kansas Agricultural and Engineering Experiment Stations is gratefully acknowledged.

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