

Book Review

Biosensors: An Introduction

by Brian R. Higgins

Wiley, New York, 1997; 200 pp.; \$69.95

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The book is divided into ten chapters describing the biological elements, transducers, performance, applications, experimental results, and commercialization. It is specifically designed for the novice. Persons interested in becoming acquainted with biosensor technology and the basic electrochemistry and spectroscopy involved in preparing and characterizing these devices will find this book useful.

A substantial portion of the book is devoted to electrochemical biosensors with a basic discussion of reference electrodes and how they are prepared. There is an excellent discussion of the different methods used in amperometry and potentiometry including a basic discussion of the electrochemistry. Several specific biosensor examples are discussed in the chapters on transducers. In addition there is a basic discussion of field effect transducers, how they work, and how they have been applied to the development of biosensors.

The book also includes a discussion of optical methods, particularly reflectance techniques including total internal fluorescence, attenuated total reflectance, and surface plasmon resonance. There is only a short description of acoustic transducers.

The one area that this reviewer felt deserved greater effort was immobilization methodology. Each of the major approaches was mentioned and a few general equations showing coupling methods was presented. However, there was insufficient discussion of the advantages and/or disadvantages of each method or the best approach for deciding on what methods to choose for specific sensor types or applications. Keeping in mind that this is a book for beginners, it could have more heavily referenced this section to lead the reader to more detailed references if desired.

The one factor that makes this book rather unique is the actual laboratory examples presented in chapter 9. The author presents the reader with a series of experiments that can be performed in the laboratory to actually prepare a biosensor, measure an analyte, and calculate the analyte's concentration in a sample. Each experiment includes the necessary information on equipment and reagents required, detailed procedures, as well as how to determine the results and discussion of the results. The experiments described are for a glucose biosensor, a urea biosensor, and a tissue-based biosensor using banana as the tissue (you can eat the portion you don't use). All these examples are electrochemical in nature.

This book is a valuable source for the student or the researcher with no previous experience in biosensor technology. It is not designed for, nor would it be of value to the experienced biosensor researcher.

Howard H. Weetall

Chemical and Biomedical Technology

Advanced Technology Program

National Institute of Standards and Technology

Gaithersburg, MD 20899-0001