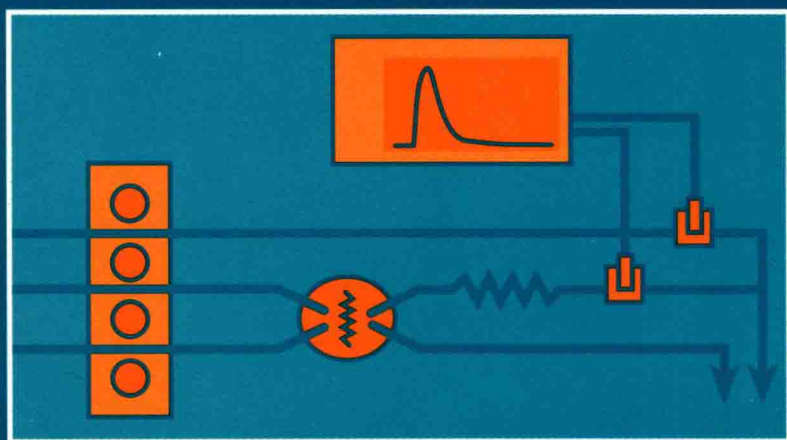


PRINCIPLES OF

CHEMICAL AND BIOLOGICAL SENSORS



Edited by

DERMOT DIAMOND

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A Series of Monographs on Analytical
Chemistry and Its Applications
J. D. Winefordner, Series Editor

Principles of Chemical and Biological Sensors

Edited by

DERMOT DIAMOND

School of Chemical Sciences, Dublin City University
Dublin, Ireland



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CHEMICAL ANALYSIS

A SERIES OF MONOGRAPHS ON
ANALYTICAL CHEMISTRY AND ITS APPLICATIONS

Editor
J. D. WINEFORDNER

VOLUME 150



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For Tara, Danny, and Helen

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PREFACE

The development of chemical and biological sensors is an extremely dynamic and exciting area of scientific research. It requires collaboration between scientists with widely differing disciplines, ranging from chemistry, biology, physics, and electronics. Teams with specialist expertise are required in analytical chemistry, synthetic chemistry, optics, electronics, signal processing, and instrumentation, if devices capable of meeting the challenging specifications of end-users with real measurement problems are to be successfully developed. Given the tremendous breadth of activity in sensor-related research, it would be impossible to cover the entire area in a book of manageable size. We therefore have restricted the coverage to those areas which more or less coincide with current research activities at DCU (although these are also evolving as the emphasis in sensor research changes).

Over the past 10 years or so, a significant contribution to the development of chemical and biological sensors has been made by researchers based in Ireland. The idea for this book grew from a series of informal meetings to coordinate sensor-related research activities at Dublin City University (DCU) that resulted in the formation of the Sensors Research Centre (1989). Since that time, sensor research at Dublin City University has continued to flourish, and at the time of this writing involves some 40 full-time researchers working on a variety of externally funded projects. Welcome infrastructural support for our research has been provided through the Biomedical and Environmental Sensor Technology (BEST) initiative funded by the International Fund for Ireland and four universities active in sensor research; Dublin City University, The University of Ulster, Queen's University Belfast, and The University of Limerick.

I would like to acknowledge the tremendous effort of all the contributors to this text, both my colleagues at DCU, and their co-authors. I would also like to take this opportunity to thank all those in the research community who have contributed to the science of sensor development and our knowledge of this fascinating subject. Through joint projects, contributions to the literature or presentations/discussions at conferences, they have also contributed to this book.

Finally, my co-authors and I would like to acknowledge the help of our families during the preparation of this text. Without their support, this book would never have been completed.

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Principles of Chemical and Biological Sensors

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