

国外化学名著系列

(影印版)2

[英] Ramaier Narayanaswamy

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Optical Sensors

Industrial, Environmental and Diagnostic Applications

光学传感器

——工业、环境与诊断应用



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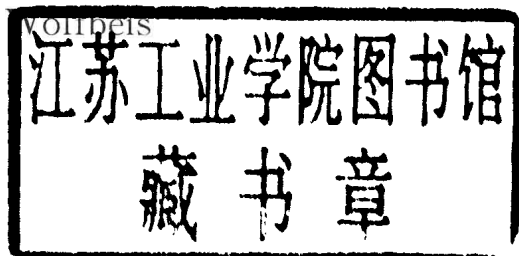
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Preface

The development and applications of optical chemical sensors and biosensors over the past two decades have been pursued with great interest by many researchers and have shown a tremendous growth and potential in employing such devices in many fields of application. These sensors require an interdisciplinary approach in that many scientific fields including spectroscopy, fibre optics and waveguides, optoelectronics, analytical chemistry and biochemistry, medicine and material science. The use of fibre optics and waveguides in sensors for advanced instrumentation is now well established and many novel integrated sensing systems, such as biochips, are now being developed.

In an attempt to disseminate the growth in optical sensors for many application areas such as industrial, environmental and medical diagnostics, several authors have been involved in producing this state-of-the-art type of monograph. This is the first book that is being published in a series on topics related to chemical sensors and biosensors by Springer-Verlag. The selection of topics and contributing authors for this first book on Optical Sensors have stemmed out of some of the excellent contributions made at the scientific sessions of the Europt(r)ode VI Conference that was held in April 2002 in Manchester, United Kingdom.

This book summarises various types of developments in optical sensor technology over the past two decades with an insight to future trends in this ever growing field. Chapter 1 reviews advances in this area using indicator probes and labels with a discussion of the factors that has lead to the growth of optical sensors. Chapters 2 and 3 reviews molecular recognition systems based on molecular imprints and new indicator dyes for sensing gaseous and dissolved analytes in the environment. Chapters 4 to 7 deal with aspects of optical biosensors and biochips for use in medical diagnostics and food analysis, while Chapters 8 to 15 discuss chemical transduction principles and optical sensor designs for monitoring analytes in industrial and environmental samples. These chapters illustrate a variety of transducer designs that have been investigated to date which include devices based on surface plasmon resonance, piezo-optic effects, integrated systems such as biochips, interferometric and array biosensors, and

involve analytical systems based on sensors with cross sensitivities and a biomimetic approach. Aspects of miniaturisation and automation are also discussed in some chapters as required, thus providing information on a truly integrated approach for analytical measurements. Thus the topics presented in this book are wide ranging and somewhat diverse but all contributions focus on diagnostics type of analytical systems.

This book is aimed at graduate students and researchers in academia and industry to provide knowledge on a group of devices based on a variety of optical detection techniques that are of novel trend in current measurements employed in analytical sciences. The authors, chosen from a list of multidisciplinary international team of researchers, are experts in their fields and are authoritative in respect of their contributions. The editors would like to express their sincere appreciation and gratitude to all authors for their efforts in preparing excellent contributions as chapters for this book with a common but diverse focus on the optical systems employed for environmental, industrial and medical diagnostic applications.

R. Narayanaswamy & O. Wolfbeis

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Contents

Chapter 1

Optical Technology until the Year 2000: An Historical Overview

OTTO S. WOLFBEIS

1	Introduction	1
2	Very Early History	2
3	Early History (up to about 1985)	3
4	Optical Sensors for Gases (Including Dissolved Gases) and Organics	6
5	Opt(r)odes for pH	9
6	Optical Sensors for Ions	11
7	Enzyme-Based Biosensors	15
8	Fiber Optic Systems	15
9	Signal Referencing	17
10	Optical Sensing Schemes	20
11	Materials for Optical Chemical Sensors and Biosensors	23
12	Imaging and Pressure-Sensitive Paints	26
13	Commercial Instrumentation Using Opt(r)odes	28
	References	30

Chapter 2

Molecularly Imprinted Polymers for Optical Sensing Devices

MARTA ELENA DÍAZ-GARCÍA, ROSANA BADÍA

1	Introduction	35
2	Molecular Imprinting Process	36
2.1	Covalent Molecular Imprinting	37
2.2	Self-assembly Molecular Imprinting	38
3	Polymer Composition	39
3.1	Templates	39
3.2	Type of Monomer and Crosslinker	40
3.3	Porogenic Solvents	42
3.4	Radical Initiators	42
4	MIP Optical Sensing Applications	43
4.1	Optical Sensing Approaches for Metals of Environmental Concern	43

4.1.1 Imprinted Metal Ion Sensors Based on Polymerizable Metal Chelates (Covalent Imprinting)	43
4.1.2 Optical Sensors Based on Non-covalent Imprinting of Fluorescent Metal Chelates . . .	44
4.2 Optical Sensing Approaches for Environmental Harmful Compounds	45
4.3 MIP Optical Sensing Materials for Organic Volatile Compounds	48
5 Conclusions and Outlook	48
References	48

Chapter 3

Chromogenic and Fluorogenic Reactands: New Indicator Dyes for Monitoring Amines, Alcohols and Aldehydes

GERHARD J. MOHR

1 Introduction	51
2 Sensing Amines	53
2.1 Trifluoroacetylazobenzene Dyes	53
2.2 Trifluoroacetylazobenzene Copolymers	57
3 Sensing Alcohols	59
3.1 Trifluoroacetylstilbenes	59
4 Sensing Aldehydes	62
4.1 Perylene Tetracarboxylbisimides	62
5 Conclusions and Outlook	64
References	65

Chapter 4

Design, Quality Control and Normalization of Biosensor Chips

CLAUDIA PREININGER, URSULA SAUER

1 Introduction	67
2 Principle	69
3 Biochip Fabrication	70
3.1 Biomolecular Probes	70
3.2 Array Manufacture	70
3.3 Slides and Immobilization	73
4 Optical Read-out	76
5 Quality Control	79
5.1 Autofluorescence	79
5.2 Arraying	79
5.3 Print buffer	80
5.4 Immobilization	80
5.5 Fluorescent Label	81
5.6 Validation	81
6 Data Collection and Analysis	82
6.1 Imaging	82
6.2 Image Analysis	83

6.3	Background	84
6.4	Quantification	85
6.5	Normalization	86
7	Statistical Analysis	86
	References	88

Chapter 5

Rapid, Multiplex Optical Biodetection for Point-of-Care Applications

FRANK Y. S. CHUANG, BILL W. COLSTON, JR.

1	Need for Advanced Biodetection	93
2	Fundamental Principles of Biodetection	94
3	Development of Optical Methods for Biodetection	97
3.1	Sandwich Immunoassays – ELISA	97
3.2	Lateral Flow Assays – “Strip” Tests	98
3.3	Fixed Microarrays – DNA Gene Chip	99
3.4	Liquid Microarrays – Luminex Flow System	101
4	Multiplex Immunoassay Diagnostic System (MIDS)	104
4.1	Disposable Sample Collection Unit	105
4.2	CCD-based Optical Hardware	109
4.3	Digital Image Analysis Software	112
4.4	Preliminary Results	112
4.5	Discussion	117
5	Conclusions and Future Directions	118
	References	119

Chapter 6

Multi-functional Biochip for Medical Diagnostics and Pathogen Detection

TUAN VO-DINH, GUY GRIFFIN, DAVID L. STOKES, DIMITRA N. STRATIS-CULLUM, MINOO ASKARI, ALAN WINTENBERG

1	Introduction	121
2	The Multi-functional Biochip	121
2.1	Integrated Circuit Development of the Biochip	123
3	Experimental Systems and Procedures	125
3.1	Instrumentation	125
3.1.1	Optical Setup	125
3.1.2	The Biofluidics System	126
3.2	Preparation of DNA Probes	127
3.3	Protocol for DNA Studies	127
3.4	Protocol for Antibody Studies	129
3.4.1	Assay for <i>E. coli</i>	129
3.4.2	Assay for FHIT Protein	130
3.5	Protocol for DNA/Antibody Combined Assay	131
3.6	Protocol for ELISA-based Detection of <i>B. globigii</i>	131
4	Results and Discussion	132
4.1	Fundamental Evaluations of the IC Biochip via Off-chip Bioassays	132

4.2	Application of the ELISA Technique to Biochip-based Detection	135
4.3	Evaluation of the Biofluidics-based Biochip System for On-chip Bioanalysis	136
4.3.1	Assay for <i>E. coli</i>	137
4.3.2	Assay for FHIT Protein	139
4.4	Portable IC Biochip Prototype with Biofluidic System	140
5	Conclusion	141
	List of Abbreviations	142
	References	142

Chapter 7

Surface Plasmon Resonance Biosensors for Food Safety

JIRÍ HOMOLA

1	Introduction	145
2	Fundamentals of Surface Plasmon Resonance (SPR) Biosensors	146
2.1	Surface Plasmon-Polaritons and their Excitation by Light Waves	146
2.2	Surface Plasmon Resonance Sensors	150
2.3	Surface Plasmon Resonance Biosensors	154
2.4	Advantages and Drawbacks of SPR Biosensors	155
3	Implementations of SPR Biosensors	156
3.1	Surface Plasmon Resonance Platforms	156
3.1.1	SPR Sensors Using Prism Couplers	156
3.1.2	SPR Sensors Using Grating Couplers	158
3.1.3	SPR Sensors Using Optical Waveguides	159
3.2	Biomolecular Recognition Elements and their Immobilization	160
3.3	Biomolecular Interactions	161
3.4	Detection Formats used in SPR Biosensors	161
4	SPR Biosensors for Detection of Food Safety-related Analytes	166
4.1	SPR Biosensor-based Detection of Chemical Contaminants	166
4.2	SPR Biosensor-based Detection of Toxins	167
4.3	SPR Biosensor-based Detection of Microbial Pathogens	168
5	Summary	170
	References	171

Chapter 8

NIR Dyes for Ammonia and HCl Sensors

PETER ŠIMON, FRANK KVASNIK

1	Introduction	173
2	NIR Transducers	174
2.1	Structure and Tests of NIR Ammonia Transducers	175

2.1.1	Metal Complexes	175
2.1.2	Polymethine Dyes	181
2.2	Structure and Tests of NIR pH Transducers	190
3	Quantum-chemical Calculations and General Rules	193
4	Influence of Matrix Quality on the Band Shape and Maximum Wavelength	195
5	Fibre-optic Distributed Sensors	196
6	Conclusions	198
	References	199

Chapter 9

Piezo-Optical Dosimeters for Occupational and Environmental Monitoring

KELLY R. BEARMAN, DAVID C. BLACKMORE, TIMOTHY J.N. CARTER,
FLORENCE COLIN, STEVEN A. ROSS, JOHN D. WRIGHT

1	Introduction	203
2	Calibration and Evaluation of New Badges	207
3	Badges for Formaldehyde Monitoring	209
4	Badges for Glutaraldehyde Monitoring	211
5	Badge for Monitoring Chlorine Dioxide	215
6	Badge for Monitoring Ozone	216
7	Badge for Monitoring Nitrogen Dioxide	217
8	Badge for Monitoring Styrene	218
9	Badge for Monitoring Ammonia	219
10	Multi-analyte Badges and the Minimisation of Interference	221
11	Fundamentals of the Piezo-optical Measurement	222
12	Future Development Prospects	223
	References	225

Chapter 10

Interferometric Biosensors for Environmental Pollution Detection

L. M. LECHUGA, F. PRIETO, B. SEPÚLVEDA

1	Background of Interferometer Biosensors	227
2	Optical Waveguides	229
2.1	Monomode Behaviour	231
2.2	Surface Sensitivity	233
3	Principle of Operation of Interferometric Sensors	235
3.1	Technology of Fabrication	236
4	Types of Interferometer Devices: State-of-the-Art	237
4.1	Fabry-Perot Interferometer	237
4.2	Mach-Zehnder Interferometer	238
4.3	Planar Versions	238
4.4	Integrated Versions	240
4.5	Young Interferometer	243
5	Surface Functionalization for Biosensing	246
6	Environmental Applications	246

7 Future Trends	247
References	248

Chapter 11

Fibre-optic Sensors for Humidity Monitoring

MARIA C. MORENO-BONDI, GUILLERMO ORELLANA,

MAXIMINO BEDOYA

1 Introduction	251
2 Definitions	252
3 Measurement of Humidity	253
3.1 Relative Humidity Monitoring	253
3.1.1 Psychrometers	253
3.1.2 Mechanical (Displacement) Hygrometers	254
3.1.3 Electric Hygrometers	255
3.2 Dew Point Sensors	255
3.2.1 Chilled Mirror (Optical Condensation) Hygrometers	256
3.2.2 Optical Absorption Hygrometers	256
3.3 Measurement of Trace Moisture	256
3.3.1 Mass Sensitive Devices (Gravimetric Method)	257
3.3.2 Coulometric (Electrolytic) Method	257
3.4 Miscellaneous Humidity Sensors	257
4 Fibre-optic Humidity Sensors	261
4.1 Fibre-optic Sensors Based on Absorption Measurements	261
4.2 Fibre-optic Sensors Based on Luminescent Reagents	268
4.3 Optical Sensors Based on Variations of the Refractive Index	273
4.4 Fibre-optic Sensors Based on Changes in the Reflectivity of Thin Films	275
5 Calibration of Humidity Sensors	277
6 Conclusions	278
References	278

Chapter 12

Optical Sensing of pH in Low Ionic Strength Waters

BEN R. SWINDLEHURST, RAMAIA NARAYANASWAMY

1 Introduction	281
2 Optical pH Sensors	283
3 Materials and Methods	295
3.1 Immobilisation by the Mannich Reaction and Manufacture of Sensing Film	295
3.2 Probe Head Design and Flow Cell Construction	295
4 Instrumentation	297
4.1 Choice of Wavelengths	298
5 Results and Discussion	299
5.1 Variation of System Response between Films	299

5.2	Temperature Response	300
5.3	Longevity of Sensing Films	301
5.4	Effect of Ionic Strength	302
	List of Abbreviations	304
	References	305

Chapter 13

Environmental and Industrial Optosensing with Tailored Luminescent Ru(II) Polypyridyl Complexes

GUILLERMO ORELLANA, DAVID GARCÍA-FRESNADILLO

1	Introduction	309
2	Ru(II) Polypyridyl Complexes	310
2.1	Light Absorption Features	312
2.2	Luminescence Features	314
2.3	Redox Features	318
2.4	Preparation	319
2.5	Physical Properties	322
2.6	Photochemistry	324
3	Acidity Sensors	326
4	Carbon Dioxide Sensors	329
5	Temperature Sensors	331
6	Oxygen Sensing with Luminescent Ru(II) Polypyridyl Dyes	331
6.1	Oxygen Optosensors	333
6.2	Luminescent Ru(II) Complexes as Oxygen Indicators	334
6.3	Polymer Support and Indicator Design	334
6.4	Luminescence Quenching Models in Heterogeneous Supports	339
6.5	Instrumentation Used in Oxygen Sensing with Ru(II) Dyes	343
6.6	Applications	344
7	Miscellaneous Sensors and Concluding Remarks	349
	List of Abbreviations and Symbols	350
	References	352

Chapter 14

TIFR Array Biosensor for Environmental Monitoring

KIM E. SAPSFORD, FRANCES S. LIGLER

1	Introduction to Biosensors	359
1.1	Biosensors for Environmental Applications	360
2	Technical Aspects of Optical Array Biosensors	361
2.1	Optical Transduction Used in Array Biosensors	362
2.1.1	Total Internal Reflection	362
2.1.2	Interferometric Techniques	363
2.1.3	SPR Imaging	365
2.1.4	TIRF	367
2.2	The Molecular Recognition Element	368
2.2.1	Immunoassays	368