

Index

A

Absorption-based indicators, 14
Acebutolol, 240, 248
Acetaminophen, 248
Acrylodan, 213, 215, 225, 228
Addition of photons by transfer of energy (APTE), 158
Aequorin, 224
Affinity based biosensors, 205
Aflatoxin, 145
Agglutination tests (AT), 145
Alkaline phosphatase, 251
Allose-binding protein (ABP), 210
Amiodarone, 246
Amodiaquine, 246
Aniline, 247
Anthocyanins, 248
Anthraquinone-2,6-disulfonate, 78
Apamin, 250
Aptamers, 186, 225
Autofluorescence, 6

B

Benzo[ghi]perylene, 20
Bioanalysis/bioanalytics, 1, 131, 155, 237
Bioelectrochemical systems, 71
Bioluminescence resonance energy transfer (BRET), 223
Biotin–streptavidin, 174
 β -lactamase (BLA), 224
 β -lactoglobulin A (β -LGA), 246, 250
Blood, 8–10, 12, 30, 142, 145, 169, 182, 185, 188, 205, 214, 228
2-Bromo-1-[6-(dimethylamino)-2-naphthalenyl]-ethanone (BADAN), 214

C

Capillary electrophoresis (CE), 237, 252
Catechin, 240, 247
Chain ejection model (CEM), 7
Charge-coupled device (CCD), 7
Charge residue model (CRM), 243
Chemical sensors, optical, 2
4-Chloroaniline, 247
Chlorpromazine, 250
Cholesterol, 143
Cinchonidine, 143
cis-platinum(II)-*meso*-tetra-(4-fluorophenyl) dibenzodiazeporphyrin (*cis*-Pt2NF), 32, 34
Clonazepam, 250
Clozapine, 246
Coelenterazine, 224
Conopressin, 250
Creatinine, 143
Cyanidin-3,5-diglucoside (cyanin), 248
Cyanidin-3-galactoside (ideain), 248
Cyc2, 79
Cyclic voltammetry (CV), 72, 91, 93, 101, 226
Cyclometallated complexes, 39
Cysteine, 213, 215, 221, 225, 246
Cytochromes, c-type, 71, 79
P450, 245
Cytomegalovirus, 174

D

Decacyclene, 20
1-Decyl-4-(1-pyrenyl) butanoate, 19
Dendrimers, 35
Deoxyynivalenol, 145

Desorption electrospray ionization (DESI), 249

Diagnostic applications, 131

Diagnostic test kits, 144

Diclofenac, 240, 247

Differential electrochemical mass spectrometry (DEMS), 239

Direct electron transfer (DET), 78

Dissolved oxygen (DO), 9

Disulfide bond reduction, 250

Dithiothreitol, 250

DNA, 3, 142, 145, 224, 248

Dopamine, 241, 248, 250, 251

Drug delivery, 133

- monodisperse particles, 142

Drug metabolism, 245

Dysprosium, 218

E

Ebselen, 250

Electroactive biofilms (EABs), 81

Electrochemical cell, 239

Electrochemically assisted injection (EAI), 253

Electrochemistry, 237, 239

Electrospray ionization (ESI), 243

- mass spectrometry (ESI-MS), 251

ELISA. *See* Enzyme-linked immunosorbent assay (ELISA)

Endothelin, 250

Energy migration-mediated upconversion (EMU), 161

Energy transfer upconversion (ETU), 158

Enzymatic biosensors, 12

Enzymatic conversion, 211

Enzyme-linked immunosorbent assay (ELISA), 145

Ethidimuron, 248

Europium, 215, 218

Excimers, 222

Excited state absorption (ESA), 158

Extracellular electron transfer (EET), 73

F

Flunitrazepam, 250

Fluorescence biosensors, 205

Förster resonance energy transfer (FRET), 30, 212, 218–223, 227

Fullerene, 54

Fumonisin B1, 144

Functionalized monodisperse particles, 131

G

Galantamine, 245

Geobacter spp., 76

Glucose, 9, 32, 34, 184, 205, 222–229

- biosensors, 8, 13, 20, 34, 143
- sensor, 8, 214, 216, 224

Glucose oxidase (GOx), 12

Glutamine-binding protein (GlnBP), 209

Glutathione, 184, 241, 246, 247, 250

Green fluorescent protein (GFP), 219

Guanosine, 248

H

Haloperidol, 240, 247

Hemoglobin, 8, 9, 16

Hepatitis B surface antigen, 146

Humic acid, 78

Hydrogen peroxide, 146

8-Hydroxyguanosine, 248

Hydroxylidocaine, 247

I

IAEDANS. *See* 5-(Iodoacetamidoethyl) aminonaphthalene-1-sulfonic acid (IAEDANS)

IANBD. *See* 4-[*N*-(2-(Iodoacetoxy)ethyl)-*N*-methylamino]-7-nitrobenz-2-oxa-1,3-diazole (IANBD)

Immunoassays, 144, 179

Indigo, 15

Insulin, 250

2-(4'-Iodoacetamidoanilino)naphthalene-6-sulphonic acid (ANS), 217

5-(Iodoacetamidoethyl)aminonaphthalene-1-sulfonic acid (IAEDANS), 213

Iodoacetamidofluorescein, 212

4-[*N*-(2-(Iodoacetoxy)ethyl)-*N*-methylamino]-7-nitrobenz-2-oxa-1,3-diazole (IANBD), 225

Ion evaporation model (IEM), 243

Ir(III) cyclometallated complexes, 41

Ir(III) porphyrins, 37

L

Lanthanides, 155, 170, 218

Lateral flow (LF) tests

- (immunochromatographic tests), 176

Leucine, 209

Lidocaine, 240, 247

Lifetime imaging techniques, 7

Liquid chromatography, 237
Long-range electron transfers (ET), 73
Luciferase, 224
Luminescence, 1, 18
 decay times, 54
 lifetimes, 6, 22
Lycorine, 246
Lysozyme, 250

M

Magnetic fluid hyperthermia (MFH), 146
MALDI–MS. *See* Matrix-assisted laser desorption ionization mass spectrometry (MALDI–MS)
N-[2-(1-Maleimidyl)ethyl]-7-(diethylamino) coumarin-3-carboxamide (MDCC), 216
Maltose-binding protein (MBP), 209
Mass spectrometry (MS), 237
Mass voltammogram, 244
Matrix-assisted laser desorption ionization mass spectrometry (MALDI–MS), 251
MDCC. *See* *N*-[2-(1-Maleimidyl)ethyl]-7-(diethylamino)coumarin-3-carboxamide (MDCC)
Mediated electron transfer (MET), 78
Metal complexes, 1
Metalloporphyrins, 26, 247
Methabenzthiazuron, 248
Methylene blue, 15
Micellar electrokinetic chromatography (MEKC), 253
Microbe–electrode interactions, 71, 74
Microbial bioelectrochemical systems (BESs), 73
Microbial extracellular electron transfer, 71
Microbial fuel cells (MFCs), 74
Monodisperse particles (MP), 131
 suspension polymerization, 133

N

Nanoparticles, 155
 living polymerization, 138
Nanowires, 71, 78–87
Naphthoporphyrin, 32
Near-infrared (NIR), 155, 214
Nitrocefin, 224
4-Nitrotoluene, 254
Nonaqueous capillary electrophoretic (NACE), 254
Norepinephrine, 251
Normetanephrine, 251
Nucleotides, 248

O

Ochratoxin, 144
Octaethylporphyrin, 26
Optical oxygen sensors, 1
OPTI system, 9
Osmium polypyridyl complexes, 24
Outer-membrane cytochromes (OMCs), 78
Oxidation/reduction reactions, 76
Oximeters, 8
Oxygen indicators, 1
Oxygen quenching, 3
Oxygen reduction reaction (ORR), 76
Oxygen sensors, luminescent, 9
 optical, 1
 ratiometric, 6
Oxyhemoglobin, 8

P

Palladium tetrakis(4-carboxyphenyl)porphyrin (PdTCPP), 29
p-Aminophenol, 251
Paracetamol, 240, 246
Paramagnetic resonance enhancement (PRE), 209
Peptides, 249, 251
Periplasmic binding proteins (PBPs), 205
Peroxalate, 148
Perrin–Jablonski diagram, 4
Perylene dibutyrate, 20
Perylene radical cation, 250
Phenacetin, 248
Phosphorescence, 6
Photoluminescence, 3
Photon avalanche (PA), 159
Photon upconversion, 155, 157
Photostability, 54
Platinum(II)-*meso*-tetra-(4-fluorophenyl)-mononaphthotribezoporphyrin (Pt1NF), 32
Platinum tetrakis(pentafluorophenyl)porphyrin (PtTFPP), 29
Point-of-care testing (POCT), 157
Polycyclic aromatic hydrocarbons (PAHs), 18
Polymer coating, 141
Polymeric particles, 131
Polyphenols, 247
Pressure sensitive paint (PSP), 19
PRODAN, 215
Propanil, 240, 248
Prostate-specific antigen, 174
Protein complementation assays, 223
Proteins, modifications, 249
Pt(II)-coproporphyrin I (PtCP), 11

Push-pull scanner, 251
Pyrene, 19
1-Pyrenebutyric acid, 20
1-Pyrenedecanoic acid, 20

Q

Quenching, 1
Quercetin, 247
Quinol oxidase (CymA), 81
Quinoneimine, 246

R

Rapid lifetime determination (RLD), 7
Redox mediators, 71
Resonance energy transfer (RET), 181
Rhodamine, 184, 221, 222
Riboflavins, 78
Ribose-binding protein (RBP), 209
Roscovitine, 247
Ru(II) polypyridyl complexes, 20
Ruthenium bis(bipyridyl)-phenanthroline-9-
isothiocyanate, 218

S

Scanning electrochemical microscopy
(SECM), 251, 254
Serum, 13, 214, 216, 220, 248
Shewanella spp., 77
Solvatochromism, 205
Somatostatin, 250
Squarewave voltammetry (SWV), 226
Staphylococcal enterotoxin B (SEB), 174
Stern-Volmer equation, 4
Sulfadiazine, 248
Surface-enhanced infrared absorption
spectroscopy (SEIRAS), 103
Surface-enhanced resonance Raman
spectroscopy (SERRS), 103

T

Terbium, 218
Tetrabenzoporphyrins, 34
Tetramethyl rhodamine (TMR), 221
Tetraphenyltetrabenzoporphyrins, 34
Theophylline, 144
Theranostics, 147
Thioindigo, 15
Thiol oxidation, 250
Thionine, 16
Toremifene, 247
Toxicity, 56, 76, 85, 142, 146
Transition metal polypyridyl complexes, 20
Triclocarban, 246
Tris(2-carboxyethyl)phosphine, 250
Tumor hypoxia, 9
Two-site model, 5

U

Upconversion, efficiency, 163
Upconversion RET (UC-RET), 181
Upconverting phosphors (UCPs), 155, 160
Uric acid, 248

V

Vasopressin, 250
Verapamil, 240, 246

W

Winkler titration, 2

Y

Yaglass, 187

Z

Zearalenone, 145