

## Index

- Acetylcholine, 324  
Acetylcholinesterase, 329  
Action Potential, 317  
Activation Energy, 51, 270, 285  
Active Transport, 312  
Alkali Metals, 198  
Alpha Helical Structure of Protein, 238  
Amino Acids, 203  
Angular Momentum, 132, 136, 167, 174, 178, 182  
Anode, 82, 261  
Antibonding Orbital, 218  
Aquaporin, 309  
ATP, 332  
ATPase, 312  
Autonomic Ganglion, 308  
Axon, 242, 321  
Bacterial Growth, 297  
Balmer Series, 168, 170  
Becquerel, 269  
Beta Pleated Sheet of Protein, 239  
Bimolecular Reaction, 270, 275  
Blackbody Radiation, 71  
Body-Centered Cubic Structure, 87, 90, 95  
Bohr Model of Hydrogen Atom, 79, 81  
Boiling Point, 202, 206, 259  
Boltzmann Constant, 11  
Boltzmann Distribution, 11, 35  
Bonding Orbital, 218  
Bond Order, 221  
Bonding Electrons, 200, 207, 221  
Bragg's Law, 86  
Cardiac Muscle, 325  
Carnot Cycle, 28  
Catalyst, 248, 267, 285, 296  
Cathode, 66, 261, 344  
Chemical Bond, 198, 222  
Chemical Equilibrium, 250, 252, 256  
Chemical Kinetics, 270  
Chemical Reactions, 195, 252, 270, 271, 285, 332  
Cholesterol, 242  
Codon, 338  
Collision, 76, 247, 270  
Commutator, 122  
Competitive Inhibition, 292  
Complex Reactions, 270, 275, 276  
Compton Effect, 76  
Conductivity, 273  
Coulombic Force, 156, 198, 328

- Covalent Bond, 197, 200, 201, 207, 240
- Crystals, 80,84-96, 102
- Cubic System, 84-87
- Cyclic AMP, 327
- Cyclic GMP, 190, 211
- Dalton, 310
- De Broglie, L., 101, 103
- Debye-Scherrer Method, 91
- Decay, 52, 267, 268
- Degeneracy, 19
- Deoxyribonucleoside Triphosphates (dNTPs), 342
- Depolarization, 318
- Dideoxyribonucleoside Triphosphates (ddNTPs), 344
- Diatomic Molecules, 115, 116, 128, 129, 131, 216
- Dielectric Constant, 202, 321
- Diffraction Pattern, 85, 90, 91, 95
- Dipole Moment, 178, 201, 206
- DNA, 190, 206, 210, 332-348
- DNA Polymerase, 342
- Effective Atomic Number, 192
- Eigenfunctions, 104, 121
- Eigenvalues, 104, 119
- Einstein, 75
- Electrode, 247, 261, 262
- Electrochemical Equilibrium, 315
- Electrochemical Potential, 308, 314, 332
- Electromagnetic Wave, 65
- Electromotive Force, 260
- Electron Cloud, 116, 129, 175, 200
- Electron Spin, 156, 182
- Electronic Configuration, 191, 193, 221
- Electrophoresis, 203, 344
- Elementary Reactions, 275, 276
- Emission Spectra, 79, 156, 181, 182
- Energy Levels, 42, 128, 168, 181
- Enthalpy, 26, 248
- Entropy, 28, 31, 34, 36, 249, 250
- Entropy and Probability, 34, 39
- Entropy Changes, 44
- Entropy of Mixing, 46, 48
- Enzyme, 206, 207, 285, 309, 312, 330, 341, 343
- Epinephrine, 329
- Equilibrium, 31, 35, 116, 262, 284, 288, 298
- Equilibrium Constant, 252, 254, 256
- Equilibrium Potential, 315
- Ethylene, 230
- Excited State, 169
- Exons, 338
- Exothermic Reaction, 257

- Face-Centered Cubic Structure, 87, 90, 92, 96
- Fatty Acids, 240
- First Law of Thermodynamics, 22
- First-Order Reactions, 277, 279, 281
- Force Constants, 119, 123, 129
- Formaldehyde, 232
- Free Radicals, 210
- Formation Reaction, 249
- Gamma Ray, 73, 268
- Gaussian Distribution, 18
- Gibbs Free Energy, 31, 249, 252, 254, 258, 260, 262
- Goldman Equation, 316
- G Protein, 308, 327
- Growth Hormone, 249
- Hamiltonian Operator, 104, 147, 156
- Harmonic Oscillator, 115, 116, 124, 128
- HDL, 243
- Heat, 22, 26, 343
- Heat Capacity, 23, 27, 129
- Heat of Formation, 248
- Heisenberg Uncertainty Principle, 112
- Helmholtz Free Energy, 31, 72
- Hermitian Operator, 119
- Hexagonal Close-Packed Structure, 87
- HIV Protease Inhibitors, 292
- Hybrid Orbitals, 228, 230, 231
- Hybridization, 228, 229
- Hydrogen Bond, 205, 238, 306, 334, 343
- Hydrogen Electrode, 262
- Hydrophilic, 303
- Hydrophobic, 303
- Hyperpolarization, 319
- Interacting System, 14
- Internal Energy, 14, 22, 24, 27, 36
- Introns, 338
- LDL, 243
- Lewis, G. N., 207
- Libosome, 304
- Lipoprotein, 242
- Ionization Energy, 169, 192, 195, 196
- Lone-Pair Electrons, 207, 208
- Lyman Series, 168
- Inhibitors, 292
- Inotropic Effects, 326, 330
- Introns, 338
- Ionotropic Receptors, 308, 324
- Irreversible Process, 30
- Isotopes, 269
- Madelung Constant, 199
- Magnetic Quantum Number, 167, 191
- Membrane Potential, 317, 315, 314
- Messenger RNA, 335
- Metabolic Receptors, 308, 327

- Millikan's Experiment, 69
- Mixing, 46, 48
- Muscarinic Acetylcholine Receptors, 326
- Mutation, 347
- Molecular Orbitals, 216, 219, 221
- Motor Nerve, 321, 323, 325
- Nernst Equation, 262, 315
- Nerve Cell, 321
- Neuromuscular Junction, 308
- Neurotransmitters, 308, 321
- Nicotinic Acetylcholine Receptors, 324
- Nitric Oxide, 210
- Nonpolar Molecules, 201, 305
- Norepinephrine, 329
- Nuclear Reaction, 267
- Nucleic Acids, 333
- Nucleotides, 333
- Operator, 104
- Orbital, 218, 228
- Organophosphates, 331
- Orthonormal, 121
- Osmosis, 311,
- Osmotic Pressure, 311
- Paramagnetism, 227
- Parasympathetic Nerve, 308, 325, 327
- Particle in a Box, 105, 113
- Partition Function, 19, 36, 41
- Pauli Exclusion Principle, 185
- Pauling, L, 197
- Periodic Table, 196
- Phage, 341
- Pharmacokinetics, 299
- Phosphatidylcholine, 304
- Phospholipids, 241, 303
- Photoelectric Effect, 74
- Photoelectron Spectroscopy, 195
- Photon, 76
- Pi Bond, 221
- Planck, M, 73
- Planck Constant, 75
- Plasmids, 341
- Polar Molecules, 201, 305
- Polarizability, 206
- Polyatomic solid, 16
- Polymerase, 338, 342
- Primers, 337, 342
- Principal Quantum Number, 159
- Promoter, 338, 346
- Protein, 236, 307
- Protein Synthesis, 337
- Quaternary Structure of Protein, 240
- Radial Distribution Function, 170
- Radiation, 71, 74, 80, 128, 267
- Radioactivity, 267
- Radium, 267
- Rate Constant, 51, 252

- Real Gases, 24  
Repolarization, 319  
Resonance, 235  
Resting Potential, 314  
Restriction Enzymes, 341  
Reversible Process, 28, 30  
Ribozyme, 339  
Rigid Rotator, 131, 146  
RNA, 335  
RNA Polymerase, 338  
Roentgen, 73, 80  
Rutherford Model of Atom, 79  
Schrodinger Equation, 103  
Schwan Cell, 242, 321  
Second Order Reactions, 271  
Secondary Structure of Protein, 238  
Sigma Bond, 221  
Skeletal Muscle, 323  
Smooth Muscle, 327  
Sodium Chloride, 198  
Solvation Shell, 202  
Spin Angular Momentum, 182  
Sphingomyelins, 241  
Splicing, 338  
Standard Hydrogen Electrode, 262  
Standing Wave, 60  
Steady-State Approximation, 282  
Stirling Approximation, 7  
Subshells, 167  
Substrate, 286  
Sympathetic Nerve, 325, 327  
Terminator, 338, 339  
Tertiary Structure of Protein, 239  
Thomson, J.J., 66  
Transcription, 338, 345  
Transcription factors, 338  
Transfection, 341  
Translation, 339  
Transmembrane Proteins, 307  
Transporter, 305  
Travelling Wave, 61  
Uncompetitive Inhibition, 295  
Uranium, 268  
Valence Electrons, 195, 200, 206  
Valence Shell, 197, 306  
Valence Shell Electron Pair Repulsion, 208  
Van Der Waals Forces, 207, 239  
Vector Analysis, 137  
Vectors, 341  
Vitamin C, 233  
Voltage Gated Channel, 203, 305, 317, 325, 327  
Water, 202, 303, 309  
Work Function, 76  
X-Ray Diffraction, 84





## Short Introduction to the Book

Chemical process proceeds toward the state of lowered Gibbs energy usually accompanied by increasing randomness. If electrons in the outermost shell of atoms interact, they will form bonding only when their molecular orbitals become in lower energy state. The quantum theory is applied to chemistry to explain chemical bonding and reactions. Experimental approach to biology has demonstrated that functions of living cells are regulated by charged or polar signaling small molecules called ligands. On the other hand physical approach explains the selective permeability of membrane which causes osmosis and the membrane potential. In the nucleus of the cell there are chromosomes made by DNA. The genetic code on DNA is carried out by m-RNA which provides the basic instructions for production of proteins in the cytoplasm. Because enzymes are proteins, their activity might be changed if the code marked on DNA is changed by mutation. Mutation could cause diseases.

## Short Biography of the Author



Dr. Tetsuya Watanabe, the author of this book, is a President of Watanabe Institute of Mathematical Biology, Hamamatsu, Japan. He graduated from Kanagawa Dental College, Japan and holds a DDS degree in dental medicine. He received Postgraduate Training and Fellowship Appointments and successively Faculty Appointments of Instructor and Associate at Dept. of Pharmacology, University of Pennsylvania, Philadelphia, USA. He was an Assistant Professor, Dept. of Pharmacology, Medical School, University of Pennsylvania from 1977 to 1980.

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