

CONTENTS

SECTION I: MATHEMATICAL TABLES AND FORMULAS	1
Exponential Notation	3
Logarithms	4
Conversion Factors	26
Mensuration Formulas	27
Defining Formulas	27
Quadratic Equation	28
International System of Units	29
Fundamental Physical Constants	32
SECTION II: THE CHEMICAL ELEMENTS	33
Alchemistic Symbols of Some Common Elements	35
Names of Chemical Elements in Five Languages	36
Discoveries and Derivations of the Elements	41
Discovery of Elements 104, 105 and 106	44
Modified Mendeleev's Periodic Arrangement of the Elements	45
Periodic Table of the Elements	46
The Periodicity of the Elements	47
Electron Configuration of the Elements	48
Combinations of Quantum Numbers	51
Order of Filling of Electronic Energy Sublevels	52
Atomic Orbitals	53
Atomic Radii	54
Ionic Radii	56
Gram-Atomic Volumes	58
First Ionization Potentials	60
Electronegativities	62
Bond Energies	64
Activity Series or Electromotive Series	65
Physical Constants of the Elements	66
Composition of the Earth's Crust	77
Composition of the Ocean	78
Composition of the Atmosphere	78
Composition of the Human Body	79
Mineral Resources of the World	80
Steel Alloys	81

Nonferrous Alloys	82
The Natural Occurring Stable Isotopes of the Elements and Their Percentage Abundance	83
Natural Radioactive Series	86
General Classes of Nuclear Transformation	87
Syntheses of Transuranium Elements	88
SECTION III: INORGANIC COMPOUNDS	89
Physical Constants of Inorganic Compounds	91
Thermodynamic Data of Selected Elements and Compounds	95
The Crystal Systems	108
Oxidation Potentials	109
The Common Oxidation Numbers of the Elements	111
Common Ions and Their Charges	112
Flame Tests	113
Borax Bead Tests	113
Solubility Rules	114
Solubility Curves of Several Inorganic Compounds	115
Solubility Table	116
Solubility Product Constants	117
Ionization Constants of Weak Acids	118
Ionization Constants of Weak Bases	119
Vapor Pressure of Water at Different Temperatures	120
Concentration of Commonly Used Reagents	120
Common Names of Chemicals	121
SECTION IV: ORGANIC COMPOUNDS	125
Organic Compounds (Name Index)	126
Physical Constants of Organic Compounds	132
A. Normal Saturated Hydrocarbons	132
B. Isomers of Some <i>n</i> -Alkanes	133
C. Alkenes	133
D. Alkynes	134
E. Cycloalkanes	134
F. Aromatic Hydrocarbons	135
G. Halogen Derivatives of Aliphatic Hydrocarbons	135

H.	Halogen Derivatives of Aromatic Hydrocarbons . . . . .	.136
I.	Alcohols . . . . .	.137
J.	Butyl Alcohols . . . . .	.137
K.	Carbohydrates . . . . .	.138
L.	Phenols . . . . .	.139
M.	Ethers . . . . .	.140
N.	Aldehydes . . . . .	.141
O.	Ketones and Quinones . . . . .	.142
P.	Aliphatic Carboxylic Acids . . . . .	.143
Q.	Aromatic Carboxylic Acids . . . . .	.144
R.	Acid Derivatives . . . . .	.145
S.	Substituted Carboxylic Acids . . . . .	.146
T.	Amino Acids . . . . .	.147
U.	Amines . . . . .	.149
V.	Nitro, Nitroso, and Azo Compounds . . . . .	.150
W.	Cyanides, Isocynides, and Isocyanates . . . . .	.151
X.	Thio Compounds . . . . .	.152
Y.	Sulfonic Acids and Derivatives . . . . .	.153
	Acid-Base Indicators . . . . .	.154
	Some Ebullioscopic and Cryoscopic Constants . . . . .	.155
SECTION V: MISCELLANEOUS . . . . .		.156
	Daily Chemical Anniversaries . . . . .	.158
	Nobel Prizes in Chemistry . . . . .	.177
	Latin and Greek Roots in Chemical Terminology . . . . .	.182
	Latin and Greek Numerals . . . . .	.189
	Greek Alphabet . . . . .	.189
	Glossary of Chemical Terms . . . . .	.190
INDEX . . . . .		.207