

Contents

Preface to the Fifth Edition	v
1. Preliminary Investigation	1
Purity	1
(a) Liquids	1
(b) Solids	3
General and Physical Characteristics	6
Examination for Constituent Elements	7
(a) Ignition	7
(b) Lassaigne's Test	7
Approximate Constitution	10
Tabular Summary of Preliminary Tests	12
2. Examination For Radicals	21
Types of Radical Involving the Detection of,	
Carbon, Hydrogen and Nitrogen	22
Carbon, Hydrogen and Sulphur	36
Carbon, Hydrogen and Halogen	43
Carbon, Hydrogen, Nitrogen and Sulphur	46
Carbon and Hydrogen only	49
3. Separation of Mixtures of Organic Compounds	65
4. Preparation of Derivatives	69
Acid Anhydrides	69
Acid Chlorides	69
Alcohols	70
Amides and Imides	71
Amides, <i>N</i> -Substituted	71
Amines, Primary and Secondary	71
Amines, Tertiary	73
Amino Acids	73
Carbohydrates	74
Carbonyl Compounds	75
Carboxylic Acids	77
Esters	78
Ethers	79
Halogenohydrocarbons	80
Hydrocarbons	81
Mercaptans (Thiols)	84

Nitriles

Nitrohydrocarbons, Halogenonitrohydrocarbons, Nitroethers

Phenols

Sulphides (Thioethers)

Sulphonic Acids

Sulphonamides

Sulphonyl Halides

5. The Use of Spectroscopic Methods

Infrared Spectroscopy

Ultraviolet Spectroscopy

6. Classified Tables of the Commoner Organic Compounds

Hydrocarbons

Ethers

Alcohols

Phenols

Aldehydes and Acetals

Ketones

Quinones

Saturated Carboxylic Acids

Unsaturated Acids

Aliphatic Hydroxy Acids

Aromatic Hydroxy Acids

Alkyl and Acyl Hydroxy Acids

Ketonic Acids

Acid Anhydrides

Simple Alkyl and Aryl Esters of Carboxylic Acids

Unsaturated Esters

Esters of Hydroxy Acids

Esters of Ketonic Acids

Lactones

Carbohydrates

Fluoro Aromatic Hydrocarbons

Chloro Hydrocarbons

Bromo Hydrocarbons

Iodo Hydrocarbons

Mixed Halogeno Hydrocarbons

Aliphatic Halogen Substituted Ethers

Aromatic Halogen Substituted Ethers

Halogen Substituted Alcohols

Halogen Substituted Phenols

Halogen Substituted Aldehydes and Acetals

Halogen Substituted Ketones

Carboxylic Acid Halides	160
Halogenoformates (Halocarbonates)	160
Halogen Substituted Carboxylic Acids	161
Halogen Substituted Carboxylic Esters	163
Aliphatic Primary Amines	164
Aromatic Primary Amines	166
Secondary Amines	169
Tertiary Amines	170
Simple and Substituted Heterocyclic Bases	172
Aminophenols	175
Simple Amides and Imides, Ureas, Guanidines	176
<i>N</i> -Substituted Amides and Imides	181
Amino Acids, Esters and Amides	186
Purines	191
Nitriles	192
Isocyanates	195
Aliphatic Nitrohydrocarbons	195
Aromatic Nitrohydrocarbons	196
Nitroethers	199
Nitroalcohols	200
Nitrophenols	201
Nitrocarbonyl Compounds	202
Nitrocarboxylic Acids	203
Nitroso Compounds	205
Azoxy, Azo and Hydrazine Compounds	206
Nitroamino Compounds	208
Nitrocarboxylic Amides	210
Alkyl Nitrites and Nitrates	211
Halogen Substituted Amines	211
Halogen Substituted Amides	213
Halogeno Nitrohydrocarbons	214
Mercaptans (Thiols)	216
Sulphides (Thioethers) and Disulphides	217
Sulphoxides and Sulphones	218
Sulphonic Acids	219
Sulphonic Esters	221
Alkyl Sulphates and Acid Sulphates	222
Sulphinic Acids	222
Thiocarboxylic Acids	222
Sulphonyl Chlorides	223
Sulphonamides	224
Thioamides	225
Thiocyanates and Isothiocyanates	226
Phosphorus Compounds	226

7. Quantitative Determination of Constituent Elements

Manual and Semi-Automatic Procedures

Determination of Carbon and Hydrogen

Determination of Nitrogen

Determination of Oxygen

Determination of the Halogens and Sulphur

Determination of Bromine, Chlorine and Iodine

Determination of Sulphur

Determination of Phosphorus

Automatic Procedures

Carbon, Hydrogen and Nitrogen on a Single Sample

Carbon and Hydrogen on a Single Sample

Oxygen

Nitrogen

8. Quantitative Determination of Reactive Groups

Determination of Acidity

Determination of Basicity

Determination of Hydroxyl, Thiol and Primary and Secondary
Amino Groups by Acetylation

Determination of 1,2-Diols and Epoxides

Determination of Esters

Determination of Amides

Determination of Methoxyl or Ethoxyl Groups

Determination of Nitro Groups

Determination of Carbonyl Groups

Determination of Unsaturation

Alkenyl Unsaturation

Alkynyl Unsaturation

9. Determination of Some Physical Properties

Determination of Molecular Weight

Molecular Weight by Mass Spectrometry

Vapour Pressure Methods

Depression of the Melting/Freezing Point Method

Density of Liquids

Refractive Index

Determination of Optical Rotation

Index