

CONTENTS

Throughout the book the left margin contains a code number which refers to the adjacent section of text. This code number is used for reference purposes and the contents shows, at the left, the first part of each code number.

Preface	ix
1	General Introduction 1
2	I . Analysis of Soils 11
3	Sample Collection and Initial Treatment 13
4	Preliminary and Physical Tests 20
	Solution Preparation
5	General Procedures 36
6	Individual Elements 42
7	Extraction Techniques 45
8	Individual Elements 54
9	II . Analysis of Vegetation and Similar Materials 69
10	Sample Collection and Initial Treatment 71
11	Preliminary Tests 80
	Solution Preparation
12	General Procedures 83
13	Individual Elements 90
14	III . Analysis of Waters 93
15	Sample Collection and Storage 95
16	Preliminary and General Tests 101
17	General Procedures for Cations and Anions 109
18	Individual Elements 116
19	IV . Inorganic Constituents 119
20	Aluminium 121
21	Boron 127
22	Calcium 131
23	Carbon 137
24	Chlorine 149
25	Cobalt 154
26	Copper 159
27	Iron 165

28	Magnesium	169
29	Manganese	176
30	Molybdenum	179
31	Nitrogen and Compounds	184
32	↖Phosphorus and Compounds	206
33	Potassium	214
34	Silicon	216
35	Sodium	220
36	Sulphur and Compounds	222
37	Titanium	225
38	Zinc	228
39	Other Nutrient Elements	234
40	V . Organic Constituents	237
41	Proximate Constituents	241
42	Carbohydrates	256
43	Nitrogenous Compounds	265
44	Fatty Acids and Lipids	279
45	Flavonoids and Related Compounds	285
46	Miscellaneous Organic Compounds	292
47	VI . Pollutants	303
48	Heavy Metals	305
49	Antimony	306
50	↖Arsenic	310
51	Cadmium	312
52	Chromium	314
53	↖Lead	317
54	↖Mercury and Compounds	320
55	Nickel	327
56	Selenium	330
57	Organic Pesticides	332
58	Extraction Systems	337
59	Clean-up Stage	340
60	Examination of Extracts	345
61	Other Classes of Pesticides	353
62	Other Pollutants	356
63	Cyanide	359
64	Fluorine	361
65	Phenols	364
66	Sulphide	365
67	Detergents	367
68	Atmospheric Materials	370
69	VII . Instrumental Techniques	375
70	Colorimetry and Related Techniques	377
71	Flame Spectroscopy	384
72	Flame Emission	384
73	Atomic Absorption	388
74	Polarography	393
75	Selective Ion Electrodes	402
76	X-Ray Fluorescence Spectrometry	404

77	Chromatography	412
78	Paper Chromatography	413
79	Thin Layer Chromatography	419
80	Column Chromatography	422
81	Gel Filtration	424
82	Gas Chromatography	427
83	Ion Exchange Chromatography	432
84	Automated Techniques	434
85	Continuous Flow Analysis	437
86	Bomb Calorimetry	456
87	VIII . Data Processing and Statistical Techniques	465
88	Basic Statistical Concepts	467
89	Design of Experiments	480
90	Calculating Procedures	484
91	Analytical Errors in Relation to Accuracy, Precision and Sensitivity	493
92	Interpretation of Data	498

Appendices 501

A.	Chemical Composition of Soils and Plant Materials	503
B.	The Significance of Chemical Data in Ecological Processes	512
C.	Bioenergetics	513
D.	Laboratory Contamination	516
E.	Laboratory Safety	517
F.	Pollution from Laboratory Chemicals	521
G.	Chemical Constants	522
H.	List of Suppliers of Equipment and Chemicals Referred to in Text	527

References 531

Index 557