

Contents

Acknowledgements	vii
1 Laboratory analysis of Quaternary materials	1
1.1 Aims and approaches	1
1.2 References	3
2 Sample documentation, preparation and storage	4
2.1 Sample documentation	4
2.2 Sample preparation	5
2.3 Sample storage	8
2.4 Subsampling	10
2.5 References	16
3 Basic laboratory techniques and procedures	18
3.1 Equipment: care, use, reading	18
3.2 Chemical solutions	41
3.3 The laboratory notebook	44
3.4 Measurement	46
3.5 References	54
4 The physical composition and analysis of regolith materials	56
4.1 Particle-size analysis	56
4.2 The shape of gravel-grade particles	101
4.3 The mesofabric of diamictons	125
4.4 The colour of regolith materials	147
4.5 Lithological analysis of gravel-grade particles	165
4.6 The heavy mineralogy of sand-grade particles	182
4.7 The magnetic susceptibility of regolith materials	201
5 The chemical composition and analysis of regolith materials	230
5.1 Introduction	230
5.2 Sources of chemical inputs to regolith materials	230
5.3 Weathering and pedogenesis	239
5.4 Movement of chemicals through the regolith	240
5.5 The accumulation of chemicals at particular positions in the regolith	242
5.6 Application of geochemical analysis to Quaternary palaeoenvironmental problems	243

5.7	Sampling and sample preparation	249
5.8	The determination of acid-extractable sodium, potassium and calcium content by flame photometry	251
5.9	The estimation of plant organic content by loss on ignition	262
5.10	The determination of calcium carbonate-equivalent content by gravimetry and gasometry	264
5.11	The determination of acid-extractable sulphate content by gravimetry	270
5.12	The electrometric determination of pH	274
5.13	The representation of geochemical data	283
5.14	References	283
6	Appendices	292
6.1	The International System of Units	292
6.2	Density and dynamic viscosity of pure liquid water at standard atmosphere as a function of temperature	294
6.3	Acceleration due to gravity	295
6.4	Typical dry bulk densities of rocks at surface temperature and pressure	295
6.5	Atomic mass	296
6.6	Minerals and their identification	297
6.7	Heavy minerals and their identification	302
6.8	Conduct in laboratories	310
6.9	References	317
	Index	319