

GEOCHEMISTRY IN MINERAL EXPLORATION

Second Edition

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Preface to the Second Edition

The first edition of "Geochemistry in Mineral Exploration", published by Harper and Row in 1962, was offered as an introduction to geochemistry as applied in exploration for solid minerals. It was addressed to four principal groups of readers: (i) to the student as an introductory textbook; (ii) to the practising exploration geochemist as a source book and reference to the literature; (iii) to the specialized research worker in allied fields, such as environmental or agricultural geochemistry; and (iv) to non-specialized earth scientists who want a source of general information on exploration geochemistry.

The same may be said about this, the second edition. The present volume, however, differs from the first edition in a number of respects. Chemical principles, chemical equilibria, and chemical phenomena relevant to dispersion of elements are strongly emphasized, with the thought that an understanding of these principles will lead to valid new exploration methods and more accurate appraisal of exploration data. Two completely new chapters have been added, on vapor geochemistry and statistical methods. Most other chapters have been thoroughly revised and updated, based on the extensive literature published since the first edition. In particular, the previous single chapters on primary dispersion and on principles of secondary dispersion have each been enlarged into two chapters. Only brief discussions are offered of other fields of applied geochemistry, such as petroleum exploration, agriculture, public health, environmental problems, and forecasting of earthquakes and volcanic eruptions.

So far as practicable, the three approaches to geochemical exploration, namely basic principles, characteristics of geochemical anomalies, and practical surveying techniques, are treated in separate chapters or sections of the book. Thus, the student can learn basic principles in Chapters 6, 7, 8 and 9, and Sections IV of Chapter 2, I of Chapter 3, IV of Chapter 4, and I and II of Chapter 5, whereas Chapters 13 and 16 and Sections VI of Chapter 5, III and V of Chapter 17, and VIII of Chapter 18 are primarily aimed at the prospector or supervisor of a project.

The many friends and colleagues who helped with the preparation of the first edition, and who are listed in the preface of that volume, are again gratefully acknowledged. For this edition, special thanks for critically reviewing individual chapters are due to Fred Ward (Chapter 3), Edward Ciolkosz (Chapter 7), Margaret Hinkle and John Lovell (Chapter 18), and Richard Howarth (parts of Chapter 19). We are indebted to Martin Hale for a review of the entire manuscript and for many helpful suggestions. Numerous other colleagues and students too numerous to acknowledge individually have contributed ideas and stimulation. For care and patience in typing several drafts of the manuscript, we thank Margaret Biggers at Pennsylvania State University. Completion of the text would not have been possible without the sabbatical leave provided to Rose by Pennsylvania State University and the facilities made available to him at the Imperial College.

Although we sincerely hope that this edition is free of inaccurate statements and faulty judgment in interpreting data, we know that this is too much to hope. For these shortcomings, we offer our sincere apologies.

A. W. ROSE, H. E. HAWKES, and J. S. WEBB

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Contents

PREFACE	v
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Chapter 1

INTRODUCTION

I. Geochemistry in Mineral Exploration	2
II. Scales and Sampling Media in Geochemical Exploration	2
A. Reconnaissance surveys	2
B. Detailed surveys	4
III. History	5
IV. Present Status	6
V. Literature	9
VI. Related Fields of Applied Geochemistry	11

Chapter 2

BASIC PRINCIPLES

I. The Geochemical Environment	13
II. Geochemical Dispersion	16
III. Geochemical Mobility	18
IV. Geochemical Reactions	18
A. Dispersion of elements under deep-seated conditions	20
B. Mobility under surficial conditions	23
V. Association of Elements	25
VI. Patterns of Geochemical Distribution	28
A. Normal background values	30
B. Statistical distribution of background values	32
C. The geochemical anomaly	34
VII. Principles of Interpretation	35

Chapter 3

PRINCIPLES OF TRACE ANALYSIS

I.	Mode of Occurrence of Trace Elements in Solids	44
A.	Stability of important minerals	46
II.	Preparation of Samples	46
III.	Decomposition of Samples	49
A.	Volatilization	51
B.	Fusion	51
C.	Vigorous acid attack	51
D.	Attack by weak aqueous extractants	52
E.	Oxidation - reduction agents	53
IV.	Separation	53
A.	Separation in liquid phase	53
B.	Separation in solid phase	54
V.	Estimation	54
A.	Colorimetry	54
B.	Emission spectrometry and spectrography	56
C.	Atomic absorption	57
D.	X-ray fluorescence spectrometry	58
E.	Fluorimetry	58
F.	Radiometric methods	58
G.	Electroanalytical methods	59
H.	Chromatographic methods	59
I.	Mass spectrometry	60
J.	Other methods	60
K.	Units for reporting chemical analyses	61
VI.	Reliability of Geochemical Analyses	61
A.	Precision	62
B.	Accuracy	65
C.	Routine checks of precision and accuracy	66
VII.	Analytical Procedures	66
VIII.	Selected References on Techniques of Chemical Analysis	70

Chapter 4

PATTERNS OF DEEP-SEATED ORIGIN—ORE TYPES,
GEOCHEMICAL PROVINCES, AND PRODUCTIVE PLUTONS

I.	Classification of Mineral Deposits	72
A.	Ore-forming processes	72
B.	Geochemical recognition of ore types	72
II.	Productive Environments of Deep-seated Origin	77
III.	Geochemical and Metallogenic Provinces	78

IV.	Processes Forming Productive Plutons	84
V.	Ores Related to Productive Plutons	87
A.	Pegmatites	87
B.	Magmatic copper-nickel sulfides	88
C.	Ores associated with granitic rocks	89
D.	Hydrothermal tin deposits	90
E.	Molybdenum, tungsten, and gold deposits	93
F.	Base-metal sulfide deposits	93
G.	Porphyry-copper deposits	94
H.	Volcanogenic massive sulfides	95

Chapter 5

EPIGENETIC ANOMALIES IN BEDROCK

I.	Formation of Diffusion Aureoles	98
II.	Formation of Leakage Anomalies	101
III.	Zoning in Epigenetic Orebodies and Aureoles	104
IV.	Examples of Diffusion Aureoles	107
V.	Examples of Leakage Anomalies and Zoning	109
A.	Polymetallic vein and replacement deposits	109
B.	Porphyry-copper and molybdenum deposits	114
C.	"Epithermal" deposits of Au-Ag-As-Sb-Hg	118
D.	Volcanogenic massive-sulfide deposits	119
E.	Mississippi-valley type lead-zinc deposits	120
F.	Leakage anomalies in specific types of material	121
VI.	Geochemical Rock Surveys	121
A.	Orientation surveys	122
B.	Collection and processing of samples	124
C.	Preparation of maps and handling of data	125
D.	Interpretation of data	126

Chapter 6

WEATHERING

I.	Nature of Weathering	128
II.	Weathering Processes	129
A.	Physical weathering	130
B.	Chemical weathering	131
C.	Biologic agents in weathering	133
III.	Factors Affecting Weathering Processes	34
A.	Resistance of minerals in weathering	34
B.	Permeability	36

C.	Climate	137
D.	Relief and drainage	138
IV.	Products of Weathering	138
A.	Residual primary minerals from the parent rock	138
B.	Secondary minerals	139
C.	Soluble products	146
D.	Residual structures and textures	148
V.	Selected References on Weathering	148

Chapter 7

SOIL FORMATION

I.	Soil Profile Development	150
II.	Factors Affecting Soil Formation	154
A.	Parent material	154
B.	Climate	154
C.	Biologic activity	157
D.	Relief	158
E.	Time	161
III.	Classification of Soils	162
A.	The Soil Taxonomy system	162
B.	Old classification of soils	163
IV.	Soils of Humid Regions	170
A.	Podzolic and related soils of temperate forested regions	170
B.	Tropical soils	171
C.	Intrazonal hydromorphic soils	173
V.	Soils of Subhumid and Arid Regions	174
A.	Grassland soils	175
B.	Desert soils	175
C.	Soils of arctic areas	176
D.	Intrazonal saline and alkali soils	178
VI.	Mountain Soils	178
VII.	Selected References on Soil Formation	179

Chapter 8

CHEMICAL EQUILIBRIA IN THE SURFICIAL ENVIRONMENT

I.	Composition of Natural Waters	181
II.	Eh-pH Relationships	181
A.	Hydrogen-ion concentration	182
B.	Oxidation-reduction potential	184
C.	Eh-pH diagrams	185

D.	Forms of sulfur and carbon in solution	188
III.	Formation of Complexes	191
IV.	Solubility of Minerals	192
V.	Adsorption and Ion Exchange on Colloidal Particles	195
A.	Ion exchange in clay minerals	196
B.	Adsorption on surfaces	197
VI.	Organic Matter	206
A.	Simple organic compounds	206
B.	Humic substances	208
VII.	Electrochemical Dispersion	212
VIII.	Selected References on Chemical Equilibria in the Surficial Environment	214

Chapter 9

MECHANICAL AND BIOLOGICAL DISPERSION IN THE SURFICIAL ENVIRONMENT

I.	Mechanical Factors	216
A.	Simple gravity movement	216
B.	Dispersion in ground water	220
C.	Mechanics of dispersion in surface water	224
D.	Dispersion by glaciers	231
E.	Dispersion by wind action	235
F.	Dispersion by animal activity	235
G.	Dispersion in permafrost areas	236
II.	Biological Factors	236
A.	The effect of vegetation	236
B.	The effect of microorganisms	238
III.	The Influence of Environment on Dispersion	238
A.	Climate	238
B.	Relief	239
C.	Rock types	239
D.	Life processes	240
E.	Time	240
IV.	Selected References on Dispersion in the Surficial Environment	241

Chapter 10

SURFICIAL DISPERSION PATTERNS

I.	Classification of Surficial Dispersion Patterns	242
II.	Syngenetic Patterns	244
A.	Clastic patterns	244

	B. Hydromorphic patterns	245
	C. Biogenic patterns	245
III.	Epigenetic Patterns	245
	A. Hydromorphic patterns	245
	B. Biogenic patterns	246
IV.	Partition of Dispersed Constituents Between Liquid and Solid Media	246
	A. Liquid media	246
	B. Solid media	248
V.	Extractability of Metal from Clastic Samples	249
VI.	Contrast	250
VII.	Form of Surficial Patterns	252
	A. Clastic patterns	252
	B. Hydromorphic patterns	254
	C. Biogenic patterns	256
VIII.	Anomalies Not Related to Mineral Deposits	256
	A. High-background source rocks	257
	B. Contamination	258
	C. Sampling errors	259
	D. Analytical errors	260
IX.	Suppression of Significant Anomalies	260

Chapter 11

ANOMALIES IN RESIDUAL OVERBURDEN

I.	Anomalies in Gossans and Leached Outcrops of Ore	261
II.	Syngenetic Anomalies in Residual Soil	266
	A. Mode of occurrence	266
	B. Form and magnitude of the anomaly	269
	C. Homogeneity	278
	D. Variations with depth and soil type	281
III.	Hydromorphic Anomalies in Residual Soil	285
IV.	Anomalies Not Related to Mineral Deposits	285

Chapter 12

ANOMALIES IN TRANSPORTED OVERBURDEN

I.	Common Features of Anomalies in Transported Overburden	288
	A. Syngenetic anomalies	289
	B. Epigenetic anomalies	289
	C. Anomalies not related to mineral deposits	290
II.	Glacial Overburden	290
	A. Syngenetic (clastic) anomalies	291

B.	Hydromorphic anomalies	300
C.	Biogenic anomalies	304
D.	Superjacent anomalies of complex origin	305
E.	Schematic models of dispersion in glaciated areas	306
III.	Organic Deposits	306
IV.	Colluvium and Alluvium	311
A.	Syngenetic anomalies	313
B.	Epigenetic anomalies	314
V.	Other Types of Transported Overburden	317

Chapter 13

GEOCHEMICAL SOIL SURVEYS

I.	Orientation Surveys	320
A.	Residual soil	321
B.	Transported overburden	325
C.	Contamination	325
D.	Choice of procedures	328
II.	Field Operations	329
A.	Sampling pattern	329
B.	Sampling procedure	333
C.	Locating and identifying samples	336
D.	Sample preparation and analysis	337
E.	Preparation of geochemical maps	339
III.	Interpretation of Data	341
A.	Estimation of background and threshold values	341
B.	Recognition of non-significant anomalies	342
C.	Distinction between lateral and superjacent anomalies	344
D.	Appraisal of anomalies	345
IV.	General Procedure for Follow-up	346

Chapter 14

ANOMALIES IN NATURAL WATERS

I.	Mode of Occurrence of Elements	348
II.	Factors Affecting Composition of Natural Waters	351
A.	Composition of rain water	351
B.	Reaction with soil and rock	352
C.	Regional and climatic factors	354
D.	Age of ground water	355
E.	Oxidation-reduction	355
F.	Adsorption	355

G.	Mixing of waters	358
H.	Background content of natural waters	358
III.	Persistence of Anomalies	358
A.	Contrast at source	358
B.	Decay by dilution	361
C.	Decay at precipitation barriers	363
D.	Re-solution at precipitation barriers	368
IV.	Time Variations	368
V.	Ground-water Anomalies	373
VI.	Stream-water Anomalies	377
VII.	Lake-water Anomalies	380
VIII.	Anomalies Not Related to Mineral Deposits	381

Chapter 15

ANOMALIES IN DRAINAGE SEDIMENTS

I.	Spring and Seepage Areas	383
II.	Active Stream Sediments	392
A.	Mode of occurrence	392
B.	Contrast	394
C.	Decay patterns	399
D.	Anomaly enhancement	406
E.	Effect of precipitation barriers	411
F.	Lateral homogeneity	413
G.	Vertical homogeneity	415
H.	Time variations	415
III.	Flood-plain Sediments	416
IV.	Lake Sediments	419
A.	Mode of occurrence	420
B.	Homogeneity and contrast	421
C.	Decay patterns	424
V.	Drainage Anomalies Not Related to Mineral Deposits	426
VI.	Marine Sediments	427

Chapter 16

GEOCHEMICAL DRAINAGE SURVEYS

I.	Orientation Survey	431
A.	Water	432
B.	Drainage sediment	433
C.	Contamination	434

II.	Choice of Material to be Sampled	435
A.	Water	435
B.	Seepage soils	436
C.	Stream sediments	437
D.	Heavy minerals	438
E.	Organic sediment	439
F.	Lake sediment and water	439
III.	Sample Layout	440
A.	Ground-water patterns	441
B.	Drainage channel patterns	442
IV.	Collection and Processing of Samples	444
A.	Water	445
B.	Stream and seepage sediment	447
C.	Lake sediment	449
D.	Heavy minerals	450
V.	Preparation of Maps	450
VI.	Interpretation of Data	453
VII.	Follow-up Techniques	454

Chapter 17

VEGETATION

I	Uptake of Mineral Matter by Plants	457
A.	Plant nutrition	457
B.	Availability of elements in soil	458
C.	Reactions in the root tips of plants	458
D.	Movement and storage within plants	463
II.	Biogeochemical Anomalies	464
A.	Variation between plant species	464
B.	Variation between plant parts	464
C.	Depth of root penetration	466
D.	Variation with other factors	467
E.	Contrast	468
F.	Homogeneity	470
G.	Form of anomalies	470
III.	Biogeochemical Surveying Techniques	471
A.	Orientation survey	473
B.	Choice of sampling medium	473
C.	Collecting and processing of samples	474
D.	Choice of analytical method	474
E.	Interpretation of data	475
F.	Advantages and disadvantages of biogeochemical surveys	475
IV.	Geobotanical Indicators	476

A.	Indicators of ground water	478
B.	Indicators of saline deposits	479
C.	Indicators of hydrocarbons	479
D.	Indicators of rock types	481
E.	Indicators of ore	481
V.	Geobotanical Surveying Techniques	484
VI.	Remote Sensing of Geobotanical Anomalies	485

Chapter 18

VOLATILES AND AIRBORNE PARTICULATES

I.	Properties of Gases and Aerosols	490
II.	Units of Measurement	491
III.	Source of Naturally Occurring Gases	492
A.	Atmospheric gases	492
B.	Deep-seated gases	494
C.	Radiogenic gases	495
D.	Biogenic gases	495
E.	Gases generated in sulfide deposits	495
F.	Atmospheric particulates	497
IV.	Reactivity of Gases	498
V.	Movement of Gases	500
A.	Diffusion	500
B.	Water transport	502
C.	Transfer between water and vapor phases	503
D.	Vapor transport	504
E.	Relative effects of infiltration versus diffusion	505
VI.	Geochemical Behavior of Selected Gases	506
VII.	Applications of Vapor Geochemistry	511
A.	Exploration for sulfide deposits	511
B.	Exploration for uranium	512
C.	Exploration for petroleum	513
D.	Location of buried faults	514
E.	Forecasting of earthquakes	514
F.	Forecasting of volcanic eruptions	514
G.	Location of geothermal areas	514
VIII.	Vapor Survey Techniques	514
A.	Soil air	516
B.	Water	516
C.	Gas traps	517
D.	Atmospheric air	517

Chapter 19

COMPUTERIZED DATA-HANDLING AND
STATISTICAL INTERPRETATION

I.	Data-handling by Computer	520
A.	Recording of data	520
B.	Production of tables, histograms, and summaries	521
C.	Computer-generated maps	521
D.	Contouring of concentrations	523
E.	Moving averages and trend surfaces	523
II.	Multivariate Statistical Methods	525
A.	Regression analysis	525
B.	Discriminant analysis	527
C.	Factor analysis	531
D.	Cluster analysis	533

Chapter 20

GEOCHEMICAL METHODS IN MINERAL EXPLORATION

I.	Optimization of Exploration	535
II.	Planning of Exploration	536
A.	Selection of professional leadership	536
B.	Selection of areas	538
C.	The exploration sequence	538
III.	Choice of Exploration Methods	540
A.	Target size	543
B.	Property control	544
C.	Reliability of method	544
D.	Cost	544
E.	Value of expected ore	545
F.	Comparison of programs	545
G.	The role of geochemistry in an exploration system	545
IV.	Organization and Operations	546
A.	Field operations	546
B.	Laboratory	547
C.	Supervision	548
APPENDIX. Geochemical Characteristics of the Elements		549
REFERENCES		583
SUBJECT INDEX		637