

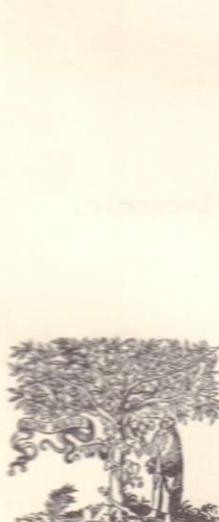
Developments in Economic Geology, 18

INDUSTRIAL MINERALS AND ROCKS

MILOŠ KUŽVART

Associate Professor

Department of Geology at the Faculty
of Natural Sciences, Charles University, Prague



ELSEVIER

Amsterdam - Oxford - New York - Tokyo 1984



Contents

Preface	13
1. Introduction	14
1.1 The term "Industrial minerals and rocks"	14
1.2 Classification of industrial minerals and rocks and principal textbooks on this subject	15
1.3 The past and present of industrial minerals and rocks	18
2. Origin of industrial minerals and rocks	21
2.1 Magmatic deposits	21
2.2 Pegmatites	25
2.3 Skarns and skarnoids	30
2.4 Carbonatites	31
2.5 Hydrothermal deposits	32
2.6 Sublimes	38
2.7 Deposits of the weathering derivation	38
2.8 Sedimentary deposits	48
2.9 Deposits of the diagenetic derivation	55
2.10 Evaporites	65
2.11 Deposits of metamorphic origin	71
3. Cycles of principal elements of industrial materials in the Nature	75
4. Survey of genetic types of industrial minerals and rocks (in tables)	91
5. Form and size of industrial mineral deposits	120
6. Deposits of industrial minerals	122
6.1 Andalusite and other high alumina minerals	122
6.2 Asbestos	127
6.3 Baddeleyite and zircon	139
6.4 Barite and witherite	142
6.5 Beryl	148
6.6 Borate	152
6.7 Celestite and strontianite	155
6.8 Corundum and emery	157
6.9 Diamond	160
6.10 Feldspar	171

6.11	Fluorite (fluorspar) and cryolite	174
6.12	Gem stones	187
6.13	Graphite	198
6.14	Magnesite	209
6.15	Micas	222
6.16	Monazite, xenotime, bastnaesite	228
6.17	Nitratine (Chile saltpetre)	229
6.18	Olivine	232
6.19	Quartz crystal	234
6.20	Sepiolite (Meerschaum)	240
6.21	Sulphur and pyrite	241
6.22	Talc and soapstone	252
6.23	Wollastonite	263
6.24	Zeolites	265
7.	Deposits of industrial rocks	270
7.1	Bauxite and Al-laterite	270
7.2	Bentonite and montmorillonite clay (bleaching clays and fuller's earth included)	280
7.3	Clays and claystones	287
7.4	Decorative stones	294
7.5	Diatomite	297
7.6	Dolomite	299
7.7	Glass sands and foundry sands	300
7.8	Gypsum and anhydrite	303
7.9	Kaolin and halloysite residue	307
7.10	Leucophyllite	317
7.11	Limestone	318
7.12	Mineral pigments	320
7.13	Perlite	320
7.14	Petrurgical rocks	322
7.15	Phosphates and apatite	324
7.16	Potassium salts	331
7.17	Quartz raw materials	340
7.18	Rock salt (halite)	345
7.19	Soda (natural)	351
8.	Deposits of building raw materials	353
8.1	Marly and siallitic materials for manufacturing cement and lime	353
8.2	Raw materials for light-weight aggregates	354
8.3	Raw materials for brickmaking	357
8.4	Gravel-sand and building sand	357
8.5	Building stone	359

9.	Unconventional, perspective, potential and substitute industrial minerals and rocks	363
10.	Minerogenetic provinces and epochs	370
11.	Geophysical methods of prospecting and exploration of deposits of industrial raw materials (E.Andres)	372
11.1	Introduction	372
11.2	Geophysical methods	374
11.3	Application of geophysical measurements on industrial minerals and rocks in Czechoslovakia .	379
12.	Laboratory investigations	398
13.	Exploitation and dressing of industrial minerals and rocks	403
14.	Industrial minerals and rocks in world economics	411
15.	Outlook for prospecting, production and use of industrial minerals and rocks in the world until the year 2000	418
16.	Literature	424
17.	Index (M. Holý)	435