

Cave Minerals of the World

Second Edition—1997

Contents

- 9 Acknowledgements
- 11 Preface
- 13 About This Book
- 15 Overview
- 17 Foreign Language Overviews
 - 17 Résumé (French)
 - 19 Übersicht (German)
 - 21 Resumen (Spanish)
 - 23 Riassunto (Italian)
 - 25 PE3IOME (Russian)
- 27 Historical Introduction,
by T. Shaw
- 45 Speleothems**
 - 47 Anthodites
 - 50 Balloons, Cave
 - 51 Blisters, Cave
 - 52 Boxwork
 - 54 Bubbles, Cave
 - 55 Caps, Cave
 - 55 Coatings
 - 56 Columns
 - 57 Conulites
 - 59 Coralloids
 - 62 Coral Pipes
 - 62 Crusts
 - 64 Cups, Cave
 - 65 Draperies
 - 66 Fibrous Speleothems
 - 68 Flowers, Cave
 - 70 Flowstone
 - 73 Folia
 - 74 Frostwork
 - 75 Geysermite
 - 76 Helictites
 - 81 Hoods, Cave
 - 81 Moonmilk
 - 84 Pearls, Cave
 - 86 Pool Fingers
 - 87 Powder, Cave
 - 88 Rafts, Cave
 - 91 Rims
 - 92 Rimstone Dams
 - 94 Rings, Cave
 - 97 Shelfstone
 - 98 Shields, Cave
 - 99 Showerheads, Cave
 - 101 Spar
 - 104 Stalactites
 - 108 Stalagmites
 - 112 Trays, Cave
 - 114 Tubes, Cave
- 117 Cave Minerals**
 - 119 Native Elements
 - 119 Deposition and Stability of
Native Elements
 - 119 Sulfur
- 120 Sulfides**
 - 120 Deposition and Stability of
Sulfide Minerals
 - 121 Sulfide Minerals
 - 121 Chalcocite
 - 121 Chalcopyrite
 - 121 Cinnabar
 - 121 Galena
 - 121 Marcasite
 - 122 Metacinnabar
 - 122 Pyrite
 - 122 Pyrrhotite
 - 122 Realgar
 - 122 Sphalerite
 - 123 Stibnite
- 123 Oxides and Hydroxides**
 - 123 Deposition and Stability of
Oxide-Hydroxide Minerals
 - 125 Oxide and Hydroxide Minerals
 - 126 Common Oxide and Hydroxide
Minerals
 - 126 Goethite
 - 127 Ice
 - 130 Other Oxide and Hydroxide Minerals
 - 130 Oxides
 - 130 Asbolane
 - 130 Birnessite
 - 131 Braunitz
 - 131 Chalcophanite
 - 131 Cryptomelane
 - 131 Cuprite
 - 131 Hausmannite
 - 131 Hematite
 - 132 Maghemite
 - 132 Magnetite
 - 132 Montepelite
 - 132 Periclase
 - 133 Plattnerite
 - 133 Pyrolusite
 - 133 Rancieite
 - 133 Romanechite
 - 134 Tenorite
 - 134 Todorokite
 - 134 Vernadite
 - 134 Hydroxides
 - 134 Böhmite
 - 135 Gibbsite
 - 135 Lepidocrocite
 - 135 Lithiophorite
 - 135 Manganite
 - 135 Portlandite
 - 136 Ralstonite
- 136 Halides**
 - 136 Deposition and Stability of
Halide Minerals

- 136 Halide Minerals
 - 136 Common Halide Minerals
 - 136 Halite
 - 138 Other Halide Minerals
 - 138 Atacamite
 - 138 Bromargyrite
 - 138 Carnallite
 - 138 Chloromagnesite
 - 138 Fluorite
 - 139 Galeite
 - 139 Kainite
 - 140 Sal Ammoniac
 - 140 Sylvite
- 140 Arsenates
 - 140 Deposition and Stability of Arsenate Minerals
 - 140 Arsenate Minerals
 - 141 Arseniosiderite
 - 141 Beudantite
 - 141 Conichalcite
 - 141 Manganberzeliite
 - 141 Mimetite
 - 141 Olivenite
 - 141 Strashimirite
 - 141 Talmessite
- 142 Borates
 - 142 Deposition and Stability of Borate Minerals
 - 142 Borate Minerals
 - 142 Tincalconite
- 142 Carbonates
 - 142 Deposition and Stability of Carbonate Minerals
 - 144 Carbonate Minerals
 - 145 Common Carbonate Minerals
 - 145 Calcite
 - 145 Aragonite
 - 146 Other Carbonate Minerals
 - 146 Ankerite
 - 148 Artinite
 - 148 Aurichalcite
 - 148 Azurite
 - 149 Baylissite
 - 149 Cerussite
 - 150 Dolomite
 - 150 Huntite
 - 151 Hydromagnesite
 - 151 Hydrozincite
 - 152 Kutnohorite
 - 152 Magnesite
 - 152 Malachite
 - 153 Monohydrocalcite
 - 153 Natron
 - 154 Nesquehonite
 - 154 Rhodochrosite
 - 154 Rosasite
 - 154 Siderite
 - 155 Smithsonite
 - 156 Strontianite
- 156 Thermonatrite
- 156 Trona
- 156 Vaterite
- 157 Witherite
- 157 Nitrates
 - 157 Deposition and Stability of Nitrate Minerals
 - 158 Nitrate Minerals
 - 159 Darapskite
 - 159 Gcwihabaite (!wihabaite)
 - 159 Hydrombobomkulite
 - 159 Mbobomkulite
 - 159 Nickelalumite
 - 160 Niter
 - 160 Nitrammite
 - 161 Nitratite
 - 161 Nitrocalcite
 - 162 Nitromagnesite
 - 162 Sveite
- 163 Phosphates
 - 163 Deposition and Stability of Phosphate Minerals
 - 164 Phosphate Minerals
 - 164 Archerite
 - 164 Ardealite
 - 164 Biphosphammite
 - 165 Bobierrite
 - 165 Brushite
 - 165 Carbonate-fluorapatite
 - 166 Carbonate-hydroxylapatite
 - 166 Chlorapatite
 - 167 Collinsite
 - 167 Crandallite
 - 167 Diadochite
 - 167 Dittmarite
 - 168 Evansite
 - 168 Fluorapatite
 - 168 Francoanellite
 - 169 Gordonite
 - 169 Hannayite
 - 169 Hopeite
 - 169 Hydroxylapatite
 - 170 Koninckite
 - 170 Leucophosphite
 - 171 Lipscombite
 - 171 Minyulite
 - 171 Mitridatite
 - 171 Monetite
 - 171 Montgomeryite
 - 171 Mundrabillaite
 - 172 Newberyite
 - 172 Niahite
 - 172 Parahopeite
 - 172 Phosphammite
 - 172 Phosphosiderite
 - 172 Purpurite
 - 172 Pyromorphite
 - 173 Sampleite
 - 173 Sasaitite

- 173 Schertelite
 - 173 Scholzite
 - 173 Spencerite
 - 174 Stercorite
 - 174 Strengite
 - 174 Struvite
 - 174 Swaknoite
 - 174 Taranakite
 - 175 Tarbuttite
 - 175 Tinticite
 - 175 Variscite
 - 175 Vashegyite
 - 175 Vivianite
 - 176 Wavellite
 - 176 Whitlockite
 - 176 Woodhouseite
 - 176 Silicates**
 - 177 Deposition and Stability of Silicate Minerals
 - 177 Silicate Minerals
 - 177 Common Silicate Minerals
 - 177 Opal
 - 179 Other Silicate Minerals
 - 179 Allophane
 - 180 Benitoite
 - 180 Boltwoodite
 - 180 Chrysocolla
 - 181 Clinocllore
 - 181 Cristobalite
 - 181 Dickite
 - 181 Endellite
 - 182 Epidote
 - 182 Fraipontite
 - 182 Halloysite
 - 182 Hemimorphite
 - 182 Illite
 - 183 Ilvaite
 - 183 Kaolinite
 - 183 Montmorillonite
 - 183 Nontronite
 - 183 Palygorskite
 - 184 Quartz
 - 185 Rectorite
 - 186 Saponite
 - 186 Sauconite
 - 186 Sepiolite
 - 187 Shattuckite
 - 187 Silhydrite
 - 187 Tridymite
 - 187 Sulfates**
 - 187 Deposition and Stability of Sulfate Minerals
 - 193 Sulfate Minerals
 - 193 Common Sulfate Minerals
 - 193 Gypsum
 - 196 Epsomite
 - 197 Mirabilite
 - 198 Other Sulfate Minerals
 - 198 Aluminite
- 198 Aluminocopiapite
 - 198 Alunite
 - 199 Alunogen
 - 199 Ammoniojarosite
 - 199 Anglesite
 - 199 Anhydrite
 - 200 Aphthitalite
 - 200 Arcanite
 - 201 Aubertite
 - 201 Barite
 - 202 Basaluminite
 - 202 Bassanite
 - 202 Blödite
 - 202 Boussingaultite
 - 203 Brochantite
 - 203 Burkeite
 - 203 Celestite
 - 204 Chalcantite
 - 204 Chalcoalumite
 - 204 Clairite
 - 204 Copiapite
 - 205 Coquimbite
 - 205 Cyanotrichite
 - 205 Despujolsite
 - 205 Devilline
 - 205 Ferrohexahydrite
 - 205 Fibroferrite
 - 206 Glauberite
 - 206 Halotrichite
 - 206 Hexahydrite
 - 206 Hydrobasaluminite
 - 207 Hydroglauberite
 - 207 Jarosite
 - 207 Kalinite
 - 207 Kieserite
 - 208 Koktaite
 - 208 Lecontite
 - 208 Loncreekite
 - 208 Löweite
 - 208 Melanterite
 - 209 Metavoltine
 - 209 Millosevichite
 - 209 Misenite
 - 209 Natroalunite
 - 210 Natrojarosite
 - 210 Pickeringite
 - 210 Picromerite
 - 210 Polyhalite
 - 210 Potassium Alum
 - 211 Römerite
 - 211 Rozenite
 - 211 Sabieite
 - 211 Sodium Alum
 - 211 Spangolite
 - 211 Syngenite
 - 211 Tamarugite
 - 212 Thenardite
 - 212 Tschermigite
 - 212 Voltaite

- 213 Zaherite
- 213 Vanadates**
- 213 Deposition and Stability of Vanadate Minerals
- 213 Vanadate Minerals
- 213 Calciovolborthite
- 213 Carnotite
- 214 Descloizite
- 214 Metatyuyamunite
- 214 Tyuyamunite
- 215 Vanadinite
- 215 Organic Minerals**
- 215 Deposition and Stability of Organic Minerals
- 215 Organic Minerals
- 215 Acetamide
- 215 Glushinskite
- 215 Guanine
- 215 Mellite
- 215 Oxammite
- 215 Urea
- 216 Uricite
- 216 Weddellite
- 216 Whewellite
- 217 Related Forms**
- 217 Lava Formations
- 219 Mud and Sand Formations
- 221 Mud and Clay Vermiculations
- 223 Organic Formations
- 224 Peat Formations
- 224 Rootsicles
- 224 Formations in Artificial "Caves"
- 226 Carbide-Derived Formations
- 226 Guano-Fire Minerals
- 229 Special Topics**
- 230 Crystallography of Speleothems, by B. Onac
- 236 Minor, Trace, and Ultra Trace Constituents of Speleothems, by J. James
- 237 Calcite-Aragonite Problem, by The Authors
- 239 Color of Speleothems, by W. White
- 244 Luminescence of Cave Minerals, by Y. Shopov
- 248 Monocrystalline and Macrocryalline Speleothems, by The Authors
- 252 Hydrothermal Cave Minerals, by Y. Dublyansky
- 255 Aerosols: Are They a Mechanism of Speleothem Growth? by A. Cigna and C. Hill
- 258 Cave Microclimate and Speleothems, by The Authors
- 261 Microorganisms and Speleothems, by D. Northup, A. Reysenbach, and N. Pace
- 266 Archaeology and Speleothems, by K. Tankersley, C. Munson, P. Munson, P. Watson, N. Shaffer, and S. Frushour
- 271 Dating and Paleo-Environmental Studies of Speleothems, by D. Ford
- 284 Speleothems and Earthquakes, by P. Forti
- 285 Speleothem Growth Rates, by The Authors
- 287 Speleothem Old Age, by The Authors
- 290 Field Observations by The Authors
- 291 Laboratory Techniques, by Y. Shopov and C. Hill
- 294 Protection of Speleothems, by P. Cabrol
- 301 Speleothems: Preservation, Display, and Restoration, by G. Veni
- 311 Top Ten Caves**
- 312 The Blue Cave, France, by P. Cabrol
- 316 Alum Cave, Vulcano Island, Sicily-Italy, by P. Forti
- 319 Liquid Crystal Cave, Israel, by A. Frumkin and P. Forti
- 323 Cupp-Coutunn Cave, Turkmenistan, by V. Maltsev
- 329 Kyûsen-dô Cave, Japan, by N. Kashima
- 331 Skipton Lava Cave, Victoria, Australia, by J. Webb
- 336 Mbobo Mkulu Cave, South Africa, by J. Martini, P. Wipplinger, and H. Moen
- 340 Caverna Santana, Brazil, by J. Labegalini and A. Auler
- 343 Lechuguilla Cave, New Mexico, USA, by H. DuChene
- 350 Kartchner Caverns, Arizona, USA, by C. Hill
- 355 Glossary**
- 367 Bibliography**
- 439 Index**