

Index

a

- Aappaluttoq 80, 102, 118, 127, 128
 abrade 71, 74, 95, 121, 222
 absorbance 57, 58, 138
 absorption 9, 37, 44, 52, 55, 57, 58
 abyssal 155
 achroite 154, 166
 actinolite 188, 209, 213
 adamantine 9, 65, 243
 Afghanistan 56, 116, 125, 133, 134, 150, 163,
 164, 173, 193, 195, 238, 239, 242, 248, 249
 afghanite 238, 239
 agate 3, 46, 219–22, 224
 Alberta 92, 214, 215, 218, 251, 252, 255
 albite 135, 142, 145, 154, 160, 176–78, 212
 albitite 209, 211
 alexandrite 40, **185–89**, 207
 allochromatic 43, 137
 alluvial 26–28, 66, 74, 89–91, 118, 121–23, 126,
 162, 181, 199
 almandine 201, 202, 207
 Alrosa 90, 92
 aluminum 6–8, 31, 33, 34, 44, 104–6, 113, 114,
 116, 118, 132, 133, **135**, 137, 138, 153, 165,
 166, 172, 175, 176, 185, 191, 202, 206, 210,
 236
 amazonite 154
 amber 3, 40, **251–53**, 257
 amblygonite 154
 amethyst 58, 61, 174, **219–22**, 224, 228, 229
 ametrine 220, 221, 229
 ammolite 251, 252, **254–57**
 ammonite 252–54, 256
 amphibole 19, 195, 209, 210, 214, 247
 amphibolite 21, 84, 114, 117, 118, 142, 149,
 209, 211, 212, 238
 Anahi 220, 224, 229
 andalusite 114
 andesite 19, 84, 223
 andradite **201–7**
 anhydrite 205
 anorthite 121
 Antananarivo 164, 169
 anthracite 22
 anticline 26, 148, 199
 Anuri 92
 apatite 10, 178, 181, 187
 aplite 160, 176, 188
 aquamarine 24, 32, 52, 131, **131–51**, 132, 153,
 154, 162, 181
 aragonite 254–58
 archaeogemmology 202
 archaeology 77, 163, 207, 218, 242, 248
 Archean 81, 87, 88, 92, 189
 Argentina 233
 argillite 213
 Argyle 74, 76, 84, 87–90
 Arizona 231, 234, 237, 238
 Arkansas 221, 252
 arsenic 6
 asbestos 204
 asterism 44, 107, 108, 110, 111, 124
 asthenosphere 15, 17, 81, 120, 246
 atom 4–6, 31–33, 68, 71, 76, 104, 133
 Attawapiskat 93
 aureole 25

Australia 16, 45, 67, 74, 84, 87–92, 101, 118,
119, 121, 122, 125, 128, 133, 144, 150, 178, 186,
189, 192, 193, 217, 223, 225–27, 229, 244, 246,
248, 249, 252
Austria 133, 146, 149–51, 185, 252

b

B-line 41
Badakhshan 193, 242, 248, 249
Baffin Island 92, 106, 109, 110, 112, 115, 192,
238–40, 248
Baikal 119, 238, 240, 242
Balmat 44, 238
Baltic 251, 252
barium 227
baryte 30, 47, 205
basalt 19, 21, 114, 116, 118–21, 128, 129, 136,
184, 192, 220, 221, 223, 229, 231, 234,
235, 245–49
batholith 176
bauxite 116, 127
Beluga 109, 110
bentonite 226
beryl 10, 30–34, 43, 47, 52, 124, **131–51**, 158–63,
166, 168, 173, 177, 178, 183, 185, 187–89, 193
beryllium 6, 8, 24, 31, 44, 112, 131–36, 141,
143–46, 149–51, 153–55, 162, 164, 179, 182,
185, 188, 189
beryllonite 154
biaxial 44, 57
bicolor 167, 170, 220, 221
bioclastic 20, 115
biotite 19, 117, 161, 186–88, 214, 240
biotitite 163
birefringence 42, 243
Bisbee 238
bismuth 163, 227
bixbyite 145, 178
Blawn Wash 145
blueschist 21, 209, 210, 214
boehmite 116
Bogota 147, 149
Bohemia 201, 203, 204, 207, 247
Bolivia 220, 224
bond 4, 8–10, 29, 30, 57
boron 24, 70, 71, 76, 143, 144, 153, 163–66
bort 73

botryoidal 10
Botswana 87, 89–90
Bragg 232, 248
Brazil 28, 40, 56, 61, 66, 87, 132–35, 149, 150,
156, 163–65, 168, 170, 173, 174, 176, 177,
180–84, 188, 220, 222, 223, 227, 229, 231
brazilianite 154
breccia 20, 25, 83, 87, 145, 146, 178, 203,
223, 240
brightfield 54
brilliance 4, 36, 50, 65, 66, 95, 97, 139
brilliant cut 66, 75, 96, 98, 103, 206
Bulgaria 80, 102, 133
Bultfontein 84
Burma (Myanmar) 47, 103, 109, 191, 193, 211,
217, 252

c

cabochon 44, 107, 110, 186, 236
calc-silicate 214, 218
calcite 10, 20, 22, 36, 42, 44, 53, 115, 127, 136,
146, 178, 180, 183, 191, 193, 194, 220, 222, 229,
239, 242
calcium 6, 7, 33, 44, 115, 166, 201, 212, 227
California 135, 150, 160, 165, 183, 217
Cambodia 118, 124, 125, 243–45, 248, 249
Canada 11, 18, 47, 67, 87, 89–93, 100, 101, 115,
127, 133, 135, 144, 146, 150, 151, 168, 178, 183,
187, 189, 192–94, 196, 204, 212, 215, 220, 229,
231, 238, 240, 246, 251, 255
carat 4, 98
carbon 6, 9, 20, 22, 24, 32, 67–69, 79, 81–82,
115, 143, 193, 229
Cassiar 212, 214
cassiterite 178, 179
cat's eye 44, 185, 186
cathodoluminescence 11, 182
cation 6, 9, 29, 30, 32, 43, 44
Catoca Mine 90
celadonite 222
cerussite 42
cesium 56, 141, 153, 155
chalcedony 46, 220–24, 229
chalcopyrite 149
Chalk Emerald 139
Chameleon Diamond 76, 101
Chatham 140

- chatoyancy 44, 45, 186
 Chidliak 93
 Chile 238, 241–42, 248
 China 47, 56, 65, 118, 133, 163, 209, 212, 218,
 231, 244, 248, 252
 Chivor 56, 147
 chlorine 7–9, 143, 157, 238
 chlorite 211, 214
 chromite 83
 chromitites 203
 chromium 33, 43, 104, 105, 113, 131, 132, 136,
 137, 139, 141, 144, 149, 173, 180, 185–89, 191,
 197, 202, 209, 231
 chrysoberyl 40, 45, 154, **185–89**
 chrysocolla 236
 chrysotile 204
 citrine 175, 181, 220
 clarity 4, 26, 56, 69, 75, 76, 78, 95–97
 clay 20–22, 116, 145, 160–62, 178, 181, 205, 226
 cleavage 9, 10, 42, 51
 clinohumite 193
 clinopyroxene 83
 cobalt 191, 192, 209, 233, 234
 colloidal 222
 colluvial 26
 Colombia 43, 56, 80, 118, 131, 133, 136, 138,
 139, 141, 146–50, 149–51, 244, 249, 252
 Colorado 150, 156, 238
 composite 55, 113, 187, 216, 256, 257
 conchoidal 10, 104, 132, 219
 concretions 252
 conductivity 54, 67–68
 conglomerate 20, 84, 203, 215
 Congo 89–92
 Connecticut 188
 convergent 15–17, 21, 146
 copal 252, 253
 copper 5, 6, 9, 43, 68, 168, 170, 236, 248
 Coquimbo 238, 241, 248
 coral 21, 115
 cordierite 80
 cornflower blue 103, 107, 120
 corrosion 71, 74, 143, 144, 161, 162
 corundum 10, 26, 28, 34, 40, 46, 52, 68, **103–29**,
 137, 138, 163, 176, 191, 193, 194, 231, 238, 240,
 244–46, 249, 257
 Coscuez 56, 136, 147, 148
 covalent 9, 67–69
 craton 15, 81–83, 86, 88, 102, 186
 cryptocrystalline 209, 214, 221
 cubic 29, 30, 42, 56, 60, 67–68, 71, 243
 culet 95, 96
 Cullinan 85
 cymophane 185
 Cyprus 232
- d**
- danburite 154
 darkfield 54
 Davdar 56
 De Beers 66, 67, 84, 89, 92, 93
 demantoid 41, **201**, 203–5
 dendritic 10, 222
 density 5, 11, 15, 19, 26, 28
 DeYoung Red Diamond 75
 diamond 4, 9–11, 13, 24, 27, 28, 32, 36, 40–42,
 44, 50, 53, 54, 57, 60, **65–102**, 104, 107, 109,
 116, 118–20, 124, 125, 131, 138, 155, 168, 181,
 204, 221
 diamondiferous 19, 66, 84, 86, 203
 diaspore 116
 diatreme 83, 84
 Diavik 86, 90, 93, 94, 101, 102
 dichroism 53, 169
 dichroscope 44, 45, 53, 57, 169, 174
 diffraction 44, 47, 55
 diffractometer 60
 diffusion 25, 55, 111, 112, 149
 dike (dyke) 83, 85, 120, 128, 155, 160, 162, 177,
 211, 223, 233
 diopside 83, 141, 174, 182, 205, 213, 234, 238,
 239, 242
 diorite 19
 dispersion 41, 42, 44, 51, 65, 67, 104, 219, 243
 dissolution 25, 72, 101
 divalent 133, 191
 divergent 15, 16, 120
 dolerite 84
 dolomite 20, 22, 115, 146, 178, 179, 191, 193,
 194, 212, 214, 220
 Dominican Republic 27, 251, 252
 doublet 55, 223
 dravite 166, 169
 dunite 19, 187, 231

e

eclogite 21, 86, 214, 217
 Ecuador 147
 Egypt 47, 132, 133, 175, 231, 238, 248
 Ekati 86, 90, 94, 101
 Elahera 165
 Elba 164
 elbaite 154, 159, 160, **165–69**, 178
 electron 4–6, 8, 9, 11, 60
 element 4–8, 32–34, 43, 56
 eluvial 26, 28, 150, 199
 emerald 4, 8, 32–34, 43, 44, 52, 55, 56, 58, 61, 80, 98, 102, 103, **131–50**, 169, 170, 172, 185, 187–89, 201
 emery 116
 emittance 39, 40
 Emmaville 144
 England 150, 189, 196
 epidote 10, 205
 Erzgebirge 179
 Ethiopia 133, 227, 228
 euclase 154, 179
 euhedral 65, 82, 104, 135, 136, 164–66, 179, 180, 219, 220, 224, 234, 235, 245
 evaporite 20, 24, 118, 146, 163, 200, 205, 235, 238
 exhume 82, 210
 extraterrestrial 233, 249

f

facet 55, 96, 124, 168, 224
 facies 83, 114, 186, 212, 223, 238
 fault 17, 18, 24, 26, 27, 82, 87, 117, 119, 126, 146, 148, 161, 194, 199, 210, 212, 216, 220, 227, 240, 247
 fayalite 33, 231
 feldspar 19, 20, 22, 44, 59, 149, 155, 157–59
 feruvite 166
 fingerprint 56, 57, 77, 163, 182, 216, 227, 229
 Finland 158, 161, 177, 182, 193, 248
 fire 41, 44, 65, 66, 95, 98, 104, 219, 223, 225, 229
 fluorapatite 154
 fluorescence 11, 34, 39, 40, 53, 54, 57, 68, 104, 106, 108, 132, 136, 138, 140, 164, 172, 243
 fluorine 143, 145, 153, 157, 175, 176, 179, 238
 fluorite 10, 11, 30, 47, 53, 135, 145, 146, 176, 178, 179

fluvial 203, 223
 flux 25, 140, 155, 157
 foitite 166
 forsterite 33, 193, **231**, 232, 234
 fortification 224
 fossil 28, 184, 227, 251–54

g

Gachala 43
 gadolinium 227
 gallium 153, 163
 garnet 10, 40, 75, 80, 81, 83, 86, 112, 155, 157, 159, 160, 178, 181, 197, **201–8**, 249
 gemmology 47, 49, 51, 53, 55–57, 59–61, 101–3
 geode 221–26, 229
 Germany 76, 118, 146, 179, 252
 gibbsite 116
 Gilgit 150, 164, 177, 178
 girdle 95
 glaciation 13
 glimmerite 186
 gneiss 21, 22, 102, 114, 117, 118, 163, 205, 214, 240
 Golconda 66
 gold 4–6, 8, 9, 11, 28, 65, 67, 68, 104, 120, 121, 137, 166, 181, 204
 Gondwana 217, 229
 goshenite **137**, 143, 149, 154
 granite 21, 126, 143, 144, 153–55, 157, 158, 161, 162, 176, 177, 183, 188, 241
 granodiorite 117, 188
 granulite 21, 114, 186
 graphite 9, 69, 77, 78, 81, 82, 193, 205
 Greece 116, 127, 129, 132
 Greenbushes 178
 Greenland 80, 102, 104, 105, 114, 116, 118, 125, 127, 128
 greenschist 21, 114, 212
 greisen 176, 177, 179
 grossular **201–4**
 Guatemala 211, 218
 gypsum 20, 57, 205, 220, 222, 226

h

Habachtal 146, 149, 151, 185, 187
 hafnium 227, 243
 halides 32

halite 20, 56
 halogen 6, 238
 hardness 9–11
 harzburgitic 86
 haiiyne 238, 239, 242
 Hawaii 231
 hedenbergite 182
 heliodor 135, 137, 139, 141, 149, 153, 154
 helium 4, 5, 7
 Hematita Mine 40, 188
 hematite 45, 52, 53, 128, 145, 177, 178
 Herkimer 221
 hessonite 201
 hexagonal 30, 32, 42, 52, 104, 106, 132, 134, 136, 164, 168, 169, 221
 hiddenite 154, **172–75**, 184
 Hooker Emerald 139, 140
 horsetail 204
 HPHT (High Pressure, High Temperature) 77–79, 101
 Hunza 114, 118, 163
 hyalite 223
 hydrogen 4, 6, 8, 163, 166, 236, 248
 hydrothermal 23, 24, 28, 140, 141, 143–46, 151, 163, 178, 179, 197, 209, 214, 220, 221, 223, 228
 hydroxides 32
 hypabyssal 83

i

Iceland 15
 idiochromatic 43
 igneous 14, 19, 21, 23, 80, 82, 83, 119, 143, 153, 154, 157, 177, 188, 192, 248, 253
 ilmenite 83, 111
 imperial, Imperial 47, 176, 178–84, 191, 192
 impurity 9, 11, 43, 71, 74, 76, 77, 104, 111, 125, 137, 185, 191, 209, 219
 incandescent 39–41, 54, 187, 206, 207
 inclusion 3, 42, 44, 45, 49–51, 54, 56, 59, 61, 77–80, 86, 95, 97, 99, 101, 102, 107, 110–12, 120, 124, 127, 128, 138, 139, 145, 151, 169, 183, 185, 186, 204, 209, 211, 219, 222, 229, 234
 India 65, 66, 77, 87, 114, 128, 131, 133, 139, 150, 151, 163, 188, 193, 217, 252
 indicolite 154, 165, 169, 170
 inorganic 3, 20
 interface 25, 51, 112

interference 57, 206, 207, 255
 intergrown 44, 104, 135
 interstitial 143, 221, 228
 intervalence charge transfer 106
 intraplate 119, 128
 iodine 7
 ions 5, 6, 106, 191
 Iran 204, 238, 249
 iridescence 44, 45, 206, 207
 iris 222
 iron 7, 9, 13, 15, 19, 32–34, 58, 104, 106, 111, 113, 118, 124, 131, 135, 136, 139, 140, 150, 165, 167, 168, 172, 180, 185, 191, 192, 207, 209, 214, 221, 228, 231, 232, 236
 isotope 25, 56, 127, 128, 150, 163, 183, 193, 195, 196, 217, 229, 238, 242, 246, 248, 249
 isotropic 42–44, 57
 Italy 66, 146, 150, 164, 204, 231, 248

j

jade 3, 46, 53, **209–18**
 jadeite 30, 47, 182, **209–12**, 217, 218
 jadeitite 209–13, 217
 Japan 206, 207, 252
 Jericho cluster, project 92
 Jwaneng 89, 90

k

K-feldspar 142, 160, 161
 Kaapvaal 87
 Kafubu 56
 kaolinite 9, 178, 179
 Kashmir 103, 108, 109, 114, 124, 125, 128
 Kazakhstan 133, 227
 Kenya 114, 118, 125, 199, 207, 231
 Kilimanjaro 197, 199
 Kimberley Process 90, 100
 Kimberley, Kimberley Mine 66, 67, 84, 89
 kimberlite 13, 19, 24, 27, 66, 67, 72, 79, 82–87, 89, 92, 93, 95, 100–2, 119, 120, 192, 203
 Korea 212, 214, 218
 kornerupine 248
 kunzite 154, 159, 172–74, 181
 kyanite 10, 11, 105, 113, 114, 117

l

labradorescence 44, 45
 labradorite 44, 45, 207

lamellae 10, 206, 207
 lamproite 80, 83–84, 87, 90, 101
 lamprophyre 118, 120, 128, 177
 lanthanide 7, 182
 lapis lazuli 3, 103, 151, 154, 182,
 238–42, 247–49
 lawsonite 218
 lazurite 238, 239, 242, 247
 lead 6, 15, 19, 23, 24, 74, 113, 118, 163, 179,
 231, 237, 247, 255
 lepidolite 154, 160, 162, 178
 leucite 84
 lherzolite 86, 203
 liddicoatite 154, 166, 168, 169
 lily-pad inclusion 234
 limestone 20, 22, 24, 27, 115, 116, 241
 lithium 56, 134, 141, 143, 145, 153, 155, 166,
 172, 233
 Lithium–Cesium–Tantalum (LCT) 155
 lithosphere 13–15, 17, 81, 102, 128, 248
 Logan Sapphire 124
 londonite 154
 longwave 53, 104, 132, 172
 LPHT (Low Pressure, High
 Temperature) 77, 78
 luminescence 11, 242
 lythophysae 178, 179

m

macle 72
 Madagascar 42, 107, 121, 123, 125, 128, 133,
 149, 164, 169, 204, 206, 207, 252
 magma 21–22, 79, 82, 83, 118, 120, 141, 143,
 155, 161, 162, 179
 magnesium 6, 7, 19, 32, 33, 82, 115, 172, 180,
 191, 192, 231, 234
 magnetite 19, 191
 Maine 153, 165, 188
 malachite 46, 131, 236
 malaya 201
 manganese 33, 145, 167, 168, 173, 180, 222,
 231, 233
 Manitoba 92, 251, 252
 mantle 13–15, 21, 23, 47, 49, 80–82, 118–21,
 128, 136, 182, 231–36, 246, 248, 249
 Maori 209, 216
 Marange 100

marble 22, 23, 26, 54, 114–18, 121, 125–28, 163,
 182, 191–97, 205, 214, 240–41
 marl 116, 203
 marquise 74, 98
 Maxixe 135, 137
 Merelani 197, 199, 200, 205
 meta-evaporite 197, 199, 204, 248
 metabauxite 117, 129
 metallic 9, 10, 15
 metalloids 6
 metamict 243
 metamorphism 21–23, 101, 114, 118, 125, 127,
 146, 151, 186, 187, 193, 196, 197, 201, 205, 241
 metapelite 149, 248
 metasediment 177, 199, 213, 235, 240
 metasomatism 23–24, 119, 122, 137, 142, 149,
 185–89, 199, 201, 203, 209, 210, 212, 213,
 217, 247
 Mexico 18, 145, 178, 207, 227, 231, 234, 238,
 249, 252
 miaroles 143, 146, 155, 161, 164, 176, 177
 mica 10, 22, 118, 146, 155, 157, 162, 164, 165,
 176, 177, 183, 205
 microcline 160
 microprobe 60, 133
 microscope 54, 55, 58–60, 194, 219, 225, 256
 migmatite 21, 117
 Minas Gerais 89, 132, 134, 150, 165, 173,
 176–78, 180, 182–84, 187
 Mogok 103, 116, 178, 191, 193, 196
 Mogul Emerald 139, 140, 150
 Mohorovicic 14, 246
 Mohs 10
 moissanite 44, 67, 68
 molybdenite 149
 monazite 102
 monochromatic 39, 59
 monoclinic 30, 42
 monomineralic 209, 233
 Montana 120, 125, 128, 252
 Montepuez 118, 123
 montmorillonite 160
 moonstone 46
 morganite 132, 135, 137, 141, 143, 149, 153,
 154, 172, 173
 Mozambique 108, 116, 118, 123, 125, 127, 128,
 133, 163, 165, 168, 170, 197, 199, 204, 205

mudstone 21
 muscovite 149, 155, 160, 178, 179
 Muzo 56, 147, 148, 151
 Myanmar (Burma) 103, 108, 116, 121, 124, 125,
 178, 188, 193, 211, 231, 253, 257

n

nacre 254
 Namibia 28, 42, 89, 90, 163, 177, 182, 183, 204
 Naxos 116, 117, 127, 129
 neon 7, 168–72
 nephrite **209**, 210, 212–18
 neutron 4, 5, 47, 77
 Nevada 207, 238
 New Caledonia 231
 New South Wales 122, 150, 186, 189
 New Zealand 209, 213, 216, 217, 244, 252
 nickel 6, 15, 231, 233, 234
 Nigeria 133, 144, 163, 165, 168, 170, 175
 niobium 141, 153, 182
 Niobium–Yttrium–Fluorine (NYF) 155
 nitrate 32, 136
 nitrogen 6, 69, 70, 77
 nodule 199, 205, 231, 234, 237
 North Carolina 172, 173, 175
 Northwest Territories 93, 94, 101
 Norway 133, 144
 Nunavut 92, 106, 109, 110, 112, 192, 239, 240

o

obduction 209, 216, 231
 obsidian 19
 octahedron 10, 29–31, 65, 67, 69, 71–72, 74,
 104, 132, 133, 137, 138, 166, 172, 175, 186, 191,
 192, 198, 201, 202, 210, 232
 oiling 140
 oligoclase 154
 olivine 19, 32, 33, 83, 100, 191, 195, **231**,
 233, 234
 Ontario 42, 45, 93, 111, 136, 169, 174, 176, 179,
 210, 229, 246
 opal 44, 45, 219, **222**, 223, 225–29
 opalescence 44, 45, 222
 ophiolite 216, 232
 Oregon 46
 orthoclase 10, 154
 orthopyroxene 83

orthorhombic 30, 42, 46, 176, 197
 oscillatory 107, 121, 207
 Ouro Preto 178–84
 oxide 32, 33, 104, 107, 112, 114, 145, 153, 154,
 191, 222
 oxidized 140

p

Padparadscha 103, 107, 109, 112
 painite 124
 Pakistan 114, 118, 133, 146, 150, 163, 177, 179,
 180, 182, 193, 207, 231
 Pala 135, 160, 165, 183
 Paleolithic 209
 palladium 6
 pallasite 233
 Pamir 238
 Panjshir 56
 Paraíba 153, 164, 168–71, 183
 Paraná 229
 pargasite 125, 191, 192, 195
 parisite 80
 pegmatite 19, 24, 137, 141–43, 149, 150,
153–83, 185–89, 197, 199, 201, 219, 244, 249
 Penas Blancas 56, 147, 148
 peralkaline 84
 peraluminous 177
 peridot 32, 43, 47, 141, 175, **231–35**, 247–49
 peridotite 118, 119, 136, 192, 202, 203, **231–35**,
 240, 247, 248
 petalite 154
 pezzottaite 154
 phenakite 149, 154, 176, 187, 189
 phlogopite 83, 186, 187, 191, 193, 238, 239
 phlogopitite 118, 187
 phosphate 32, 157, 236
 phosphorescence 11
 phyllite 21, 22, 178
 pigeon's blood red 103, 108, 124
 placer 28, 104, 121, 124, 163, 164, 189, 191, 194,
 202, 243, 245
 plagioclase 19, 160
 planerite 236
 platinum 6, 68, 109, 139, 168
 pleochroism 44–47, 53, 164, 174, 185, 189
 plumasite 163
 pluton 19, 21, 154, 155, 157

pneumatolysis 145, 151, 178
 pocket 19, 55, 57, 141, 143, 158–62, 164, 176
 Poland 251
 polariscope 57
 pollucite 154, 155
 polyhedron 29–31, 69, 104, 133, 137, 166,
 198, 236
 polymineralic 209, 242
 porphyries 237, 238
 potassium 6, 7, 19, 24, 82, 155, 158
 Potosi 178
 pounamu 209, 216
 prograde 21, 23, 186, 193, 197, 201, 205, 238
 protolith 26, 118, 205
 proton 4, 5
 provenance 183, 204, 238, 242, 247–49
 pseudobrookite 145
 pyralspite 201, 202
 pyrope 80, **201–4**, 206, 207
 pyroxene 19, 172, 209, 210
 pyrrhotite 191

q

quartz 9–11, 19, 20, 22, 25, 28, 30, 32, 36, 47,
 50, 52, 57, 67, 68, 87, 132, 135, 142–46, 149,
 154, 157, 159–61, 164, 165, 169, 174, 176,
 178–81, 183, 188, 197, 199, **219–29**, 257
 quartzite 22, 84, 85
 Quebec 92, 127
 Queensland 118, 225

r

radiance 40
 radiation 34, 37, 39, 53, 77, 78, 228, 243, 247
 radioactive 77, 181, 243, 246
 radium 77
 Raman 54, 59, 60
 Rapakivi 158, 161, 182
 Ratanakiri 244, 248, 249
 reflection 9, 34–37, 50, 53
 refraction 9, 34, 35, 41, 42, 44, 50, 51, 53, 55, 59
 refractive index 29, 35, 36, 41, 42, 50, 51, 53, 55
 refractometer 53, 54
 resinous 9, 253
 resistivity 67
 resorption 72–74, 94, 111, 162
 retrograde 23, 197, 205, 217, 238

rhodizite 154
 rhodolite 201
 rhombohedral 10, 30
 rhyolite 19, 134, 137, 145, 151, 176–78, 182
 richterite 84
 rossmanite 154, 166
 rubellite 153, 154, **168–70**
 rubidium 153, 155, 217
 ruby 3, 4, 23, 44, 45, 52, 65, 80, 102, **103–29**,
 131, 137, 138, 145, 163, 169, 182, 191, 192,
 196, 201
 Russia 87, 90–92, 118, 133, 138, 150, 165, 177,
 181, 185, 188, 203, 231, 238, 240, 244, 251, 252
 rutile 68, 107, 108, 110, 111, 179

s

salt 6, 8, 9, 20, 21, 253
 sandstone 20–22, 87, 203, 215, 223, 253
 sanidine 178
 sapphire 4, 23, 34, 36, 38, 44, 45, 53, 102,
103–29, 131, 169, 183, 184, 189, 191, 246, 249
 sapphirine 80
 Sar-e-Sang 238, 248
 Saskatchewan 92, 251, 252
 scandium 6
 scapolite 54, 118, 191, 192, 197, 205, 238, 239,
 242, 248
 scheelite 149
 schist 21, 22, 84, 117, 144, 146, 149, 150, 164,
 188, 202, 205, 212, 214, 217, 248
 schorl 144, 159, 160, 164–66
 Scotland 120, 128
 sedimentary 19–21, 23, 24, 26, 115, 146, 203,
 205, 221, 227, 229, 251
 selvage 25
 semi-nephrite 212, 213
 semitranslucent 46, 47
 semitransparent 46, 47
 serpentine 232
 serpentinite 149, 188, 202, 209–12, 213,
 215, 217
 Serra Geral 220, 223, 229
 shear 24, 25, 125–27, 146, 188, 193, 196, 220
 shortwave 53, 54, 104, 106, 132, 172, 243
 Siberia 90, 242, 252
 Sicily 252
 siderite 136, 252

silica 113, 114, 118, 219, 221–23, 227–29
 silicate 32, 104, 132, 138, 163, 172, 207
 silicon 6–8, 13, 24, 31, 32, 44, 79, 106, 113, 114,
 132–34, 143, 153, 166, 172, 175, 185, 209, 210
 sillimanite 114
 siltstone 20, 87
 silver 5, 6, 9, 67, 68, 237
 skarn 163, 176, 207, 241, 247
 Slovakia 121, 129, 184, 227, 229
 sodalite 238, 239
 sodium 6–9, 44, 133, 143, 165, 166, 209
 South Africa 66, 83, 87, 89–92, 133, 151, 200
 South America 16, 139
 South Dakota 173, 183
 Spain 185, 187, 249, 252
 spectrometer 55, 57–60, 207
 spectroscopy 55
 spectroscopy 54, 59–61, 80, 163, 183, 184, 189
 spectrum 36–39, 53–55, 57, 58, 71, 77, 78, 106,
 137, 138, 164, 182
 spessartine 145, 154, 176, **201**, 202
 sphalerite 44
 spinel 42, 53, 81, 83, 103, 111, 112, 125, 127,
 128, 181, 189, **191–96**, 238, 240, 257
 splintery 10, 11, 51
 spodumene 142, 153, 154, 162, **172–75**, 182–84
 Sri Lanka 28, 45, 103, 108, 111, 114, 118, 121,
 124, 125, 165, 191, 193, 244, 248
 stable isotope 151, 163, 183, 196, 217, 237
 staurolite 117
 stockwork 143
 stoppaniite 146, 150
 strain 25
 streak 9, 52
 striations 106, 132, 134, 145, 164, 168, 169, 176
 strike slip 26, 119, 126
 strontium 60, 217, 237
 subduction 14, 15, 17, 21, 82, 115, 120, 218, 231
 substitution 33, 34, 67, 69, 104–6, 132–37, 166,
 185, 191, 192, 201, 205, 209, 221, 236, 243, 246
 sulfate 32, 150
 sulfide 9, 32, 80, 179, 237
 sulfur 6, 32, 248
 sunstone 44–46
 syenite 163
 symmetry 10, 26, 29, 32, 67, 68, 71, 95, 243
 syncline 26

synthetic 3, 4, 45, 49, 54, 57, 58, 61, 79, 102,
 103, 110, 112, 113, 140, 141, 189

t

talc 10, 149, 188
 tantalum 153, 155, 182, 183, 227
 Tanzania 90, 118, 125, 128, 133, 188, 191, 193,
 197, 199, 200, 202, 205, 207, 227, 252
 tanzanite 44, 53, **197–200**, 204
 tetragonal 29, 30, 42, 243
 Thailand 108, 116, 118, 124, 125, 138
 thermoluminescence 11
 thorium 243
 thrust fault 47, 119, 146, 148, 247, 248
 thunderegg 221, 224
 titanate 60
 titanite 41, 42
 titanium 34, 104, 106, 107, 111, 113, 118, 168
 topaz 10, 103, 113, 145, 151, 153, 154, 172,
 173, **175–84**
 topazolite 181
 tourmaline 10, 24, 46, 125, 142, 144, 153, 154,
 157, 159, 160, **162–71**, 173, 176, 178, 179,
 181–84, 187, 248, 249
 translucent 46, 47, 53, 103, 135, 209, 211,
 221, 222
 transmittance 38, 55, 137
 transparent 9, 40, 42, 43, 46, 97, 103, 135, 137,
 141, 145, 162, 166, 178, 224, 257
 tremolite 187, 204, 210, 214, 215, 218
 trichroic 197
 triclinic 30, 42
 trigonal 164
 triphane 173
 triplet 51, 55, 222, 223, 256
 tsavorite 197, **199–3**, 204, 205, 207
 tungsten 39, 179, 185, 206
 turquoise 43, 46, 47, 53, **236–38**, 248–50

u

Udachnaya 89
 ugrandite 201, 202
 Ukraine 177
 ultramafic 82, 186–88, 216
 ultramarine 238
 ultrapotassic 82
 ultraviolet 11, 14, 37, 53, 243

uniaxial 42, 44, 57, 219
 United States 11, 18, 178, 238, 249
 Ural 114, 149, 181, 185, 188, 203, 204
 uranium 243, 246
 Uruguay 220, 223, 229
 UV-VIS-NIR (Ultraviolet-Visible-Near Infrared) 57, 58
 uvarovite **201**, 203
 uvite 166

V

vacancy 70, 71, 75, 77, 166
 valence 6, 9, 33
 Vallerano 66
 vanadates 32
 vanadium 104, 136, 141, 144, 180, 191, 197,
 201, 204, 205–7, 231, 233
 vein 24, 25, 28, 52, 143, 144, 146, 149, 164, 176,
 178–80, 183, 188, 197, 199, 200, 212, 220, 226,
 233, 237, 248
 Venezuela 147
 verdelite 154, 169
 vesicular 19
 Vietnam 103, 108, 116, 118, 125–29,
 163, 191–96
 VIS-NIR (Visible-Near Infrared) 171
 vitreous 9, 147, 191, 236, 243
 volatile 82, 109, 139, 155, 157, 161, 162
 volcanic 15, 17–19, 21, 79, 82, 119, 120, 146,
 178, 182, 203, 221, 227, 244, 247, 248, 251, 253
 volcaniclastic 83

W

wallrock 25
 waterline 224

watermelon 164, 165, 167
 wavelength 11, 34–42, 55, 58, 77, 137, 138,
 163, 171
 weathering 21, 23, 26–28, 118, 121, 125, 150,
 178, 181, 223, 238, 243
 whiteschists 248
 Winza 118, 128
 Wittlesbach 76
 wollastonite 241, 242

X

X-ray 47, 60, 207, 218
 xenocryst 83, 114, 118–21, 192, 231, 245, 248
 xenolith 83, 118, 121, 128, 192, 231, 234

Y

Yogo Gulch 120, 122, 128
 yttrium 141, 153
 Yukon 92, 135, 144, 151, 212, 215, 217

Z

Zambia 56, 133, 142, 150, 151, 165, 167, 168
 zeolite 21, 220
 Zimbabwe 90, 92, 100, 133, 150, 178, 231
 zinc 191, 233
 zinnwaldite 176, 179
 zircon 44, 59, 68, 124, 128, 154, 181, 193,
243–49
 zirconia 60, 67, 68, 243
 zirconium 33, 227, 244, 246
 zoisite 46, 197, 198, 200, 205
 zoning 55, 107, 120, 121, 134, 142, 155, 157,
 160, 178, 207, 212, 222
 zultanite 40

