

## Index

- Ag<sub>2</sub>S, 41  
α-spodumene, 242  
alternate gliding, 6  
andorite, 41  
anomalous dispersions, 24  
antigorite, 197  
astrophyllite, 261  
astrophyllite group minerals, 263  
azoproteite, 116
- babingtonite, 70  
bafertisite, 261  
barite, 3, 257  
benjaminite, 48  
β-barite, 257, 258  
biopyriboles, 3  
bismuthinite, 17, 49  
    structure of, 53–54  
blatterire, 115–117, 144–146, 150,  
    155–156  
blatterite homologous series, 117, 150–  
    157  
bonaccordite, 116  
bond valences, 25, 195, 235, 290  
bond-valence analysis, 217  
bond-valence parameters, 235  
boulangerite, 215, 225  
Brandt's groupoids, 128, 229  
brucite type, 3  
B33 type, 219  
B33<sub>(PbS)</sub>, 219–225  
    definition of, 219  
building blocks, 3  
bustamite, 65, 73, 265  
    yttrium germanate analogue of, 11,  
    265–269  
bustamite solid solution, 11  
bustamite structure type, 11
- CaGeO<sub>3</sub>, 11  
cannizzarite, 15, 54  
    structure of, 49  
CaSiO<sub>3</sub>, 6  
catalysis, 122  
CaTi<sub>2</sub>O<sub>4</sub>, 8, 59  
cation distribution, of lillianite  
homologues, 22–26  
cation ordering, in pinakiolite, 121  
Ca<sub>4.8</sub>Y<sub>0.8</sub>[Ge<sub>3</sub>O<sub>9</sub>], 11, 265  
C-centered clinopyroxene, 63  
cell-twin elimination, 27  
cell-twinning, 6, 12, 39, 40, 83, 97,  
    114, 123, 133, 136, 153, 157, 180,  
    187–189, 190, 191, 225, 227  
cell-twin operation, 76, 230  
cell-twin periodicity, 36, 39  
chemical N, definition of, 43  
chemical twinning, 7  
chestermanite, 116–117, 153, 155–156  
chondrodite series, 1, 3, 5  
chrysoberyl, 280, 285  
clinoferrrosilite, 73  
clinohypersthene, 243, 248  
clinopyroxene, 75  
Co<sub>2</sub><sup>2+</sup>Co<sup>3+</sup>BO<sub>5</sub>, 125  
common lattice, 16, 28  
compound superstructure, 98–109  
computer graphics, 168  
contracted mapping, 31, 233  
contracted twin, 33, 35, 233  
contracted twinning, 18  
coordination number, 94, 235, 141–  
    242  
cosalite, 17, 51  
crystallographic N, definition of, 43  
crystallographic shear, 4  
crystallographic slip, 4, 227

- crystallographic vacancies, 13  
 CS structure, 13, 227  
 cuboids, 203  
 Cu-free meneghinite, 215  
   structure of, 222  
 cyclic twinning, 8
- danburite, 285  
 defect of slip mode, 131–133  
 defect of twin mode, 131–133  
 detwinning, 27–30  
 di-capped trigonal prismatic  
   coordination, 22  
 dislocation, 31–32
- EDR, 113, 276, 280  
   definition of, 271  
 effective distribution radius, 113, 271  
 elastic strain energy, 26  
 electron-density distribution, of  
    $[\text{BO}_3]^{3-}$ , 113  
   of 4-coordinated boron atoms, 278  
 en echelon dispositions, of Q layers in  
   plagionite homologues, 176–177  
 En-IV-N, definition of, 76  
 En-IV-N series, 86  
 EnIV-N homologues, 83  
 EnIV-N, definition of, 77  
 EnIV-N series, 235, 242  
   structure scheme of, 77–85  
 EnIV'-N, definition of, 77  
 EnIV'-N series, 86  
 enstatite, 64  
 enstatite-IV homologous series, 63–  
   109  
 eskimoite, 42  
 extended lillianite homologous series,  
   15, 41–47
- ferrosilite III, 64, 65, 67, 73  
 $\text{FeYb}_2\text{S}_4$ , 62  
 $5\text{PbS}\cdot\text{Bi}_2\text{S}_3$ , 26  
 forsterite, 240, 241, 279, 285  
 Frank neighbors, 238, 240
- fredriskssonite, 116  
 Friedel's four twin types, 16  
 fülöppite, 163, 165, 190–191, 195–  
   199, 210  
   Pb-free analogue of, 191
- galena, 15, 17, 30, 31, 163, 180, 216  
 galenobismutite, 17, 26, 47, 51  
 garnet, tetragonal type, 247–249  
 glide twin, 7  
 gliding, 76  
 gliding en echelon, 4  
 gustavite, 22, 42  
   structure of, 45–47
- hairpin mechanism, 27  
 haradaite, 263  
 heteromorphite, 163, 167, 184, 190–  
   191, 198–199, 207–209  
 heterovalent vacancy-coupled  
   substitution, 11, 227  
 hexagonal ferrites, 5  
 heyrovskyite, 15, 17, 31  
   derivation from the PbS structure,  
   20–26  
   transformation into PbS, 27–32  
 high resolution electron microscopy  
 (HREM), 99, 136, 180, 230  
   of lillianite homologues, 26–31, 42  
   of En-IV-10, 81  
   of EnIV'-10, 98  
   of oxyborates, 132  
   of takéuchiite, 140  
 high clinohypersthene, 73  
 high pigeonite, 73  
 higher-order superstructures, of EnIV-  
   N series, 98–109  
 Hückel electronic band calculations,  
   230  
 homologous series, 1, 227  
   variable-fit, 50  
 hulsite, 115, 116  
   structure of, 117–124  
 HVVC, 114

- definition of, 11,
- HVVC substitution, 22, 190, 225, 227
  - of extended lillianite homologous series, 42–45
  - of enstatite-IV series, 63
- incongruent melting, 76
- isomorphism, 1
- Inorganic Crystal Structure Database, 235
- intergrowth, 4, 49
- Ito twins, 7, 8
- kernite, 280
- kotoite, 113
  - structure of, 271–276
- lamprophyllite, 4,
- lamprophyllite sheet, 2, 261
- layer modules, 13
- layer symmetry, 176
- lead sulfantimonites, high-temperature
  - homologous series of, 215–225
- lillianite, 15, 17, 31
  - derivation from the PbS structure, 20–26
  - transformation into PbS, 27–32
- lillianite homologous series, 15–41
- lillianite-like homologues, 47
- LiFeSiO<sub>4</sub>, 279
- LiScSiO<sub>4</sub>, 279
- LiScSi<sub>2</sub>O<sub>6</sub>, 85
- local operation, 6, 228, 260
- ludwigite, 117
  - 6Å-, 133, 150
  - structure of, 121–124
- ludwigite-vonsenite solid solution, 115, 124–125
- margarite, 244
- mechanical twin, 7
- meneghinite homologous series, 217
- metasilicate chains, 64
- MgGeO<sub>3</sub>, 228
- MgSiO<sub>3</sub>, 63
- micas, 244
- mica polytypism, 253
- mixed-valence iron borate, 121
- MnDy<sub>2</sub>S<sub>4</sub>, 62
- MnHo<sub>2</sub>S<sub>4</sub>, 62
- MnS-Y<sub>2</sub>S<sub>3</sub> system, 59–62
- MnSiO<sub>3</sub> polymorphs, 247–249
- MnYb<sub>2</sub>S<sub>4</sub>, 62
- MnY<sub>2</sub>S<sub>4</sub>-MnY<sub>4</sub>S<sub>7</sub> series, 60
- Mn<sub>2</sub>Y<sub>6</sub>S<sub>11</sub>, 60
- Mn<sub>3</sub>Y<sub>8</sub>S<sub>15</sub>, 62
- Mn<sub>4</sub>Y<sub>10</sub>S<sub>19</sub>, 62
- mono-capped trigonal prism, 35, 59
- molybdenum oxides, 4
- morphotropy, 1, 4, 65
- mummeite, 48
- muscovite, 246
- NaCl-type, 168, 204, 219
- net charges of atoms, of kotoite, 276
  - of sinhalite, 280
- Ni<sub>2</sub>AlBO<sub>5</sub>, 125
- Ni<sub>2</sub>FeBO<sub>5</sub>, 125
- non-commensurate layers, 3
- nonconservative twinning, 5
- non-Frank neighbors, 240
- octahedral bands, of pyroxenoids, 66–70
  - symbolism of, 67, 91
  - of EnIV-N homologues, 88–93
- OD-structures, 128, 229
- O’Keeffe-Voronoi polyhedron, 237
- olivine, 3, 75, 241
- orthoferrosilite, 73, 86
- orthopinakiolite, 114, 116–117, 137, 143–144, 146
- orthopyroxene, 75
- ourayite, 42
- oxyborates, 113–157
- pavonite homologous series, 47–49
- PbS-Bi<sub>2</sub>S<sub>3</sub>-Ag<sub>2</sub>S ternary system, 41

- PbS-Bi<sub>2</sub>S<sub>3</sub> system, 15–41  
 PbS-like structure, 51, 164, 208, 210, 211  
   -like fragments, 53  
   -like module, 54  
   -like slabs, 173  
 PbS matrix, 32  
 PbS-Sb<sub>2</sub>S<sub>3</sub> system, 215–216  
 Pb<sub>2</sub>Sb<sub>2</sub>S<sub>5</sub>, 215  
 Pb<sub>3</sub>Sb<sub>2</sub>S<sub>6</sub>, 215  
 Pb<sub>4</sub>Sb<sub>4</sub>Se<sub>10</sub>, 51  
 Pb<sub>5</sub>Sb<sub>6</sub>S<sub>14</sub>, 180, 225  
 Pb<sub>7</sub>Sb<sub>4</sub>S<sub>13</sub>, 225  
 PbS structure, 29, 31, 52, 174, 175, 180, 218, 221  
   at high pressure, 219  
 pectolite, 70  
 perovskite-type MgSiO<sub>3</sub>, 243–245  
 phase-V homologous series, 32–41  
 phase-V series, structural features of, 35–39  
 pinakiolite, 113, 116–117, 137, 143–145  
   structure of, 117–124  
 pinakiolite group, 114  
 pinakiolite homologous series, 117  
 pinakiolite homologues, structural details of, 137–150  
 plagiionite, 168, 171, 172, 184, 185, 190–191, 198, 199, 205, 206, 209, 210  
   structure of, 164  
 plagiionite group, 8  
 plagiionite homologous series, 161–211  
   mode of cation distribution of, 191–203  
 plane defects, in pinakiolite, 125–133  
 planar defects, 13  
 polysomatic series, 3  
 polymorphism, 4  
 polysynthetic twin lamellae, 15  
 polysynthetic structure, 22  
 polytypism, 4  
 protoenstatite, 64, 75  
 protopyroxene, 75  
 pyrochroite, 257  
 pyroxene, 65, 67  
 pyroxenoid homologous series, 64–74  
 pyroxferroite, 65  
 pyroxmangite, 65, 67, 73, 247  
 pseudotetragonal layer, 51  
 pseudoquadratic layer, 51  
  
 Q layers, 175, 288  
   definition of, 51  
 Q ribbons, 177, 191, 225  
   of fülöppite, 203  
   of plagiionite, 203  
   of Pb<sub>3</sub>Sb<sub>2</sub>S<sub>6</sub>, 222  
  
 radial electron distributions, 276  
 rayite, 163  
 rhodonite, 65, 67, 73, 247  
 robinsonite, 225  
 rod symmetry, 178  
 rutile-like slabs, 4, 229  
 rutile type, 4  
  
 Sb lone pair electrons, stereochemical activity of, 208, 211  
 Sb-rich pinakiolite, 116–117, 153, 155–156  
 Sb-S bonding, 204–210  
 Sb<sub>10</sub>S<sub>15</sub>, 191  
 Sc series of enstatite-IV, 64  
 semioctahedron, 35, 174, 175  
 semseyite, 163, 167, 190–191, 198, 199, 207, 209, 210  
   structure of, 288–293  
 serendipity, 63  
 7PbS·Bi<sub>2</sub>S<sub>3</sub>, 26  
 shear structures, 4  
 silicate chains, of pyroxenoids, 70–74  
   of EnIV-N homologues, 85–93  
 sinhalite, 271, 285  
   structure of, 277–280  
   structure as a function of temperature, 280–285

- Si-O-Si bond angle, 85–88
- site potentials, 124
- [Si<sub>2</sub>O<sub>7</sub>TiO] sheet, 2–3, 261–263
- 6Å-ludwigite, 133, 150
- SnS structure type, 173–177
- space groupoids, 127, 229
- spinel-based units, 5
- spiral twins, 8
- square bipyramid, 48, 140, 164, 168
- stereochemical activity of Sb, 208
- stibnite, 208,
  - unit ribbon in, 218
- subcell, 179
  - of plagiogonite, 168, 173
  - PbS-like, 202
- substructure, 12, 173
  - PbS-like, 196
  - PbS-type, 202
- sulfantimonites, 162, 191, 219
- sulfosalts, 161–162, 180
  - (Pb, Bi)-bearing, 26
- supercells, of En-IV-N, 79
- superstructure, 78
  - reflections, 63
- swinging twinings, 8
- synchrotron radiation, 24
  
- takéuchiite, 116–117, 137, 140, 143–147
- TCT, definition of, 8
- TCT mechanism, 47, 49, 60, 115, 125
  - of phase-V subseries, 38–39
  - of extended lillianite homologous series, 47
  - of EnIV-N series, 96–97
- TCT series, 227
- thortveitite, 75, 77
  
- TiO<sub>2</sub>-like slabs, 5
- TII-type, 180, 204
- TlSbS<sub>2</sub>, 204, 219
  - structure of, 177–179
- TlSbSe<sub>2</sub>, high-temperature phase, 179
- treasurite, 42
- tungsten oxides, 4
- tropos, 7
- twinning by reticular merohedry, 16
- twinning in galena, 15–17
- twinning on the cell scale, 7
- tropochemical cell-twinning, 7–9, 97, 133–150, 166, 190–191, 225, 227
  - definition of, 7
  
- vacancy-coupled replacement of cations, 8
- vikingite, 42–43
  - structure of, 45–47
- vernier structures, 51
- vonsenite, 116, 117, 122, 124
- Voronoi polyhedron, 235
- V<sub>7</sub>O<sub>13</sub>, 4, 13, 228
  
- wallpaper structures, 115
- wavy cation array, 196
- weighted mean bond length, definition of, 242
- wollastonite, 64, 65, 73, 186
- wollastonite-pyroxene series, 63
  
- xonotlite, 238
  
- Y<sub>5</sub>S<sub>7</sub>, 59
- yoshimuraite, 3
  - structure of, 253–261
- Young's modulus, 31