

SUBJECT INDEX, VOLUME 76, 1991

- Ag_{1.5}Bi_{5.5}S₉, 665
Ag_{3.5}Bi_{7.5}Si₁₃, 665
Ag₉SbTe₂S₄, 665
Ag₁₀FeTe₂S₄, 665
²⁷Al, 309
Al₂SiO₅, 677
AuPb₂BiTe₂S₃, 1434
Au₃(Ag,Pb)As₂Te₃, 1434
α-spodumene, 42
Actinolite, 1184
Actinolite and hornblende,
 coexisting, 1184
Actinolite and hornblende,
 exsolution between, 1184
Activity model
 stauroilite, 1910
AFM
 hematite, 1442
Akaganéite, 272
Alaska
 dacite, 1662
Alberta
 analcime, 189
 analcime phonolite, 189
 blairmorite, 189
 sanidine, 189
 trachyte, 189
Albite, 1328, 1646, 1773
Albite, Ga analogue, 92
Albite, Ga-bearing, 92
Albite, Ge analogue, 92
Albite, Ge-bearing, 92
Algodonite, 2020
Alkali feldspar, 218, 913, 1620
Allanite, 589
Alluaivite, 1728
Aluminosilicate, F-bearing, 309
Aluminosilicate glass, 309
Aluminosilicate-(Li-Na)Cl, 611
Aluminum silicate, 1563
Amesite, 647
Amphibole, 548, 617, 756, 971,
 1002, 1306, 1646, 1920
Amphibole, Cl-rich, 1920
Amphibole, exsolution
 microstructures in, 971
Amphibole, tremolitic, 1811
Amphibole, tremolitic (synthetic),
 1811
Amphibolite, 956, 1184
Anaglyphic filters, 657
Analcime, 189
Analcime channel H₂O, 189
Analcime phenocryst, 189
Analcime phonolite, 189
Analysis, chemical (mineral)
 actinolite, 1184
 akaganéite, 272
 alkali feldspar, 218, 913
 allanite, 589
 amesite, 647
 amphibole, 548, 756, 1002, 1306,
 1646, 1920
 analcime, 189
 anandite, 1683
 andradite, 1249
 anorthite (synthetic), 1110
 anthophyllite, 942, 956
 apatite, 83, 574, 681, 1857, 1990
 apatite, rare-earth bearing, 1165
 arsenopyrite, 1964
 ashburtonite, 1701
 augite, 956
 barite, 1964
 beusite, 1985
 biotite, 138, 218, 548, 574, 713,
 956, 1174, 1261
 biotite, Ba-rich, 1683
 biotite, titanian, 1205
 boehmite, 445
 boninite, 1940
 bornite, 1363
 boromuscovite, 1998
 braunite, 1431
 brushite, 1722
 calcite, 713, 1964
 calcite, magnesian, 1889
 chlorite, 628, 867, 1061, 1205
 chrome spinel, 1646
 chromite, 561
 cianciulliite, 1708
 clay minerals, 1964
 clinohumite, 1061
Analysis, chemical (mineral), *cont.*
 clinopyroxene, 756, 1061, 1141,
 1306, 1328
 clinozoisite, 589, 1061
 clintonite, 1061
 columbite, 1261, 1897
 cordierite, 942
 corrensite, 628
 crocidolite, 1467
 cummingtonite, 956, 971
 diopside, 904
 dissakisite-(Ce), 1990
 dolomite, 713
 edenite, Mn-rich, 1431
 elbaite, cuprian, 1479
 epidote, 628
 Fe-Ti oxide, 548
 fayalite, manganian, 288
 feldspar, 1646
 fergusonite, 1261
 fluocerite, 1261
 fumarole, 1662
 garnet, 138, 756, 956, 1061,
 1153, 1431, 1950
 garnet, grossular-andradite, 1319
 garnet, zoned, 1781
 gedrite, 942, 956
 gillulyite, 653
 glaucophane, 971
 graftonite, 1985
 grossular, 1153
 heulandite-clinoptilolite, 1872
 högbomite, 942, 956
 hollingworthite, 1694
 hornblende, 176, 218, 574, 956,
 1184
 hydroxylapatite, 1722
 illite, 1563
 ilmeneite, 956
 ishikawaite, 1261
 isocubanite, 1363
 kentrolite, 1389
 kornepine, 1824
 kyanite, 501
 långbanite, 1408
 ludwigite, 1061
 lüneburgite, 1400

- Analysis, chemical (mineral), *cont.*
 magnetite, 756, 956, 1061
 margarite, 1061
 mica, 681
 milarite, 1836
 minnesotaite, 1905
 monazite, 1261
 muscovite, 713, 1205, 1563
 muscovite, Ba-rich, 1683
 okhotskite, 241
 olivine, 218, 1061
 opal, 1863
 orthoclase, 956
 orthopyroxene, 756, 956, 1674
 pargasite, 1061
 pentlandite, 1363
 phlogopite, 470, 1061
 phlogopite (synthetic), 1485
 pitiglianoite, 2003
 plagioclase, 138, 477, 574, 756, 956, 1061, 1261, 1306, 1328
 plagioclase feldspar, 713
 pumpellyite-(Mn²⁺), 241
 pyrite, 1964
 pyroxene, 218, 1950
 quartz, 1863
 radtkeite, 1715
 rutile, 1205
 rutile, Fe-bearing metamorphic, 113
 sanidine, 1261
 saponite, 628
 sarcopsidite, 1985
 serendibite, 1061
 sinhalite, 1061
 solid solution, monosulfide, 1363
 sphalerite, 1038
 spinel, 956, 1061
 staurolite, 27, 501, 1910
 sulfide, metal excess Fe-rich, 1363
 TiO₂, 113
 takanelite, 1426
 talc, ferrous, 1905
 taranakite, 1722
 thomsonite, 1061
 thorite, 60, 1261
 thorogummite, 60
 titanite, 370, 548, 1205
 tourmaline, 681, 1061
 tourmaline, cuprian, 1479
 tremolite, 713, 1931
 uranothorite, 60
 wadsleyite (synthetic), 354
- Analysis, chemical (mineral), *cont.*
 warwickite, 1380
 yoderite (synthetic), 1052
 zircon, 60, 74, 1261, 1510, 1533
- Analysis, chemical (rock)
 anorthosite, 1306
 basalt glass, Fe³⁺-Fe²⁺ of, 1940
 carbonate, metamorphosed, 1002
 chalcedony, 1863
 dacite, 548
 flint, 1863
 fumarole, 1662
 garnet amphibolite, 589
 glass, 189
 glass inclusions, 1628
 glass, rhyolitic, 530
 granite, 574
 granodiorite, 574
 granophyre, 1646
 monzodiorite, 1306
 pelite, 848
 rhyolite, 1261
 rhyolite glass, 288
 schist, calcareous, 713
 tin rhyolite, 1628
 topaz, 1261
 trachyandesite, 1306
 ultrabasic rocks, kyanite-bearing, 501
 ultrabasic rocks, staurolite-bearing, 501
- Anandite, 1683
 Anatase, 343
 Anchimetamorphism, 230
 Andalusite, 313, 1597
 Andalusite-sillimanite-kyanite, 313
 Anderson, Charles A., Memorial of, 306
 Andradite, 1249
 Ankanigite, 2020
 Ankerite, 659, 661
 Ankerite-dolomite, 857
 Annite, 218
 Anorthite, 148, 1061, 1120
 Anorthite, Al-Si ordering in, 1110, 1120
 Anorthite, Al-Si ordering kinetics in, 1120
 Anorthite + diopside = grossular + pyrope + quartz, 148
 Anorthite, domain coarsening in, 1110
- Anorthite + enstatite = pyrope + grossular + quartz, 148
 Anorthite quartz, 1328
 Anorthite (synthetic), 1110, 1120
 Anorthoclase, 928
 Anorthosite, 1306, 1920
 Antarctica
 dissakisite-(Ce), 1990
 marble, 1990
 sillimanite, 1597
 Anthophyllite, 942, 956, 1589
 Anyuinite, 299
 Apatite, 83, 574, 681, 1165, 1857, 1990
 Apatite, rare-earth bearing, 1165
 Aragonite, 641, 1547
 Argentina
 beusite, 1985
 meteorite, El Sampal, 1985
 Arizona
 garnet, 1950
 grandreefite, 278
 pyroxene, 1950
 Arkansas
 novaculite, 1597
 quartz, 1018
 Arsenopyrite, 1964
 Asbestos, 1467
 Ashburtonite, 1701
 Ash-flow tuff, 288
 Astrocyanite-(Ce), 665
 Atomic force microscopy
 albite, 1773
 Augite, 785, 956
 Awards
 Distinguished Public Service Medal of the MSA, acceptance of, 1744
 Distinguished Public Service Medal of the MSA, presentation of, 1743
 Mineralogical Society of America Award, acceptance of, 1741
 Mineralogical Society of America Award, presentation of, 1740
 Roebling Medal, acceptance of, 1738
 Roebling Medal, presentation of, 1736
 Awaruite, 1356, 2020
- B, 681
 B, crystal chemistry, 1824
 Ba₃(Ti_{1.2}Nb_{4.8})Si₄O_{25.4}, 665

- β -(MgFe)₂SiO₄, 1765
 Babingtonite, 892
 Barite, 1964
 Barium titanosilicate, 1434
 Basalt, 1940
 Basalt glass, Fe³⁺-Fe²⁺ of, 1940
 Basalt glass, H₂O content of, 1940
 Belkovite, 1728
 Berborite polytypes, 1728
 Berthierite, bismuthian, 2020
 Beusite, 1985
 Billingsleyite, 2020
 Biopyribole, 728
 Biotite, 138, 161, 218, 548, 574, 713, 956, 1174, 1205, 1261
 Biotite, Ba-rich, 1683
 Biotite, Fe³⁺ in, 161
 Biotite, titanian, 1205
 Bismuth ramdohrite, 2020
 Blairmorite, 189
 Blueschist, 971
 Boehmite, 445
 Bogdonovite, 2020
 Bøgvadite, 1728
 Bohdanowiczite, 257
 Bolivia
 dacite, 548
 Boninite, 1940
 Book reviews
 Foit, F.F.: *Manual of Mineralogy*, 20th edition, by C. Klein and C.S. Hurlbut, Jr., 1759
 Grover, J.: *Minerals and Rocks: Exercises in Crystallography, Mineralogy, and Hand Specimen Petrology*, by Cornelis Klein, 1759
 Kesler, S.E.: *Sediment-hosted Stratiform Copper Deposits*, by R.W. Boyle, A.C. Brown, E.C. Jowett, and R.V. Kirkham, 1441
 Treiman, Allan H.: *Origins of Igneous Rocks*, by Paul C. Hess, 672
 Bornite, 1363
 Boromuscovite, 1998
 Braunitz, 1431
 Brazil
 andalusite, 1597
 elbaite, cuprian, 1479
 kyanite, 1597
 zircon, 1533
 Breccia contact, intrusive impact, 773
 Breccia, explosion, 218
 Breccia, impact, 773
 Broken Hill, 681
 Brucite, 1769
 Brushite, 1722
 Bubble rise times, 1081
 Burpalite, 665
 Byelorussite-(Ce), 665

 CH₄, 230
 C-O-H system, 713
 C-O-H-S, 1344
 CO₂, 230, 1547
 CO₂-CH₄, 230
 CO₃ disorder, 641
 CaNiSi₂O₆, 1777
 CaO-Al₂O₃-Na₂O₄-SiO₂, 1328
 CaO-MgO-Al₂O₃-SiO₂, 148
 CaO-MgO-Al₂O₃-SiO₂-B₂O₃-H₂O-CO₂, 1061
 CaO-MgO-SiO₂-H₂O-CO₂, 743
 Cu-(Fe + Ni)-S system, 1363
 (Cu,Fe)_{1-x}(Pd,Rh,Pt)_{2+x}S₂, 1434
 Cu-Fe-Zn-S, 1038
 Cu(Pt,Ir,Rh)₂S₄, 1434
 Calcio-ancylite-(Nd), 1728
 Calcite, 713, 857, 1061, 1547, 1964
 Calcite, magnesian, 641, 1889
 Calcite-IV, 1547
 Calcite-V, 1547
 Calcium clin amphibole, 985
 Calibration, 1092
 California
 allanite, 589
 apatite, 574
 biotite, 574
 boromuscovite, 1998
 clinozoisite, 589
 enclaves, mafic, 574
 garnet amphibolite, 589
 hornblende, 574
 pegmatite, granitic, 1998
 plagioclase, 574
 quartz, 530
 rhyolite, 530
 vesuvianite, 397
 Camgasite, 2020
 Canada
 illite, 1973
 Carbonate, C in, 713
 Carbonate, metamorphosed, 1002
 Carbonate, O in, 713
 CATS, 1328
 Chalcedony, 1863
 Chemical formula
 platynite, 257
 Chile
 dacite, 548
 schist, pelitic, 138
 Chiluite, 665
 Chlorite, 113, 628, 867, 1061, 1205
 Chlorite, *d*₀₀₁ vs. composition, 1373
 Chlorite, new nomenclature, 2020
 Chlorite-saponite, mixed-layered, 628
 Chondrule, 1356
 Chrome spinel, 1646
 Chromite, 561
 Cianciullite, 1708, 1711
 Clay minerals, 1964
 Clinobehoitte, 665
 Clinohumite, 1061
 Clinomimetite, 2020
 Clinopyroxene, 756, 900, 1033, 1061, 1141, 1306, 1328
 Clinopyroxene, fluid inclusions in, 1344
 Clinopyroxene-plagioclase-quartz, 1328
 Clinozoisite, 589, 1061
 Clintonite, 1061
 CMSH, 1931
 Columbite, 1261, 1897
 Columbite, Fe in, 1897
 Compressibility measurements
 finite strain theory, 1765
 Na₂Si₂O₅, 1449
 silicate melt, 1449
 stishovite, 733
 wadsleyite, 1765
 Computer programs
 crystal structure models, 293
 Drill, 293
 geobarometry, 2009
 geothermometry, 2009
 LCLSQ, 663
 MacSuite, 2013
 P-T-t path calculations, 2009
 RECALC2, 295
 rock and mineral classification, 2013
 Connecticut
 apatite, 1857
 Cordierite, 313, 942

- Cordierite-orthoamphibole, 942
 Coronal textures, 756
 Corrensite, 628
 Crocidolite, 1467
 Cross-polarization, $^{19}\text{F} \rightarrow ^{27}\text{Al}$, 309
 Crystal chemistry, 1910
 staurolite, 1910
 Crystal growth
 albite, Ga analogue, 92
 albite, Ge analogue, 92
 garnet, grossular-andradite, 1319
 pyrope, 49
 quartz, 530, 1291
 rutile, 1205
 titanite, 548, 1205
 Crystal structure
 akaganéite, 272
 albite, 1773
 albite, Ga-bearing, 92
 albite, Ge-bearing, 92
 amesite, 647
 amphibole, 1920
 ankerite, 659, 661
 apatite, 1857
 apatite, rare-earth bearing, 1165
 ashburtonite, 1701
 beusite, 1985
 biotite, 1174
 cianciulliite, 1711
 clinopyroxene, 900, 1141
 columbite, 1897
 dolomite, ferroan, 659, 661
 grandreefite, 278
 grunerite, 1502
 heulandite-clinoptilolite, 1872
 ingodite, 257
 joseite, 257
 joseite-B, 257
 kassite, 283
 kawazulite, 257
 kentroliite, 1389
 kornepurine, B-free, 1824
 laitakarite, 257
 långbanite, 1408
 lüneburgite, 1400
 MgAl_2O_4 (synthetic), 1455
 $[\text{Mg}(\text{H}_2\text{O})_6]\text{CsCl}_3$, 1884
 magnesio-hornblende, 1811
 milarite, 1836
 milarite group, 1836
 milarite, yttrian, 1836
 mullite, incommensurate structure
 of, 332
 Crystal structure, *cont.*
 norrishite, 266
 phase AnhB, $\text{Mg}_{14}\text{Si}_3\text{O}_{24}$, 1
 phase B, $\text{Mg}_{12}\text{Si}_4\text{O}_{19}(\text{OH})_2$, 1
 pitiglianoite, 2003
 pyroxenoid, 900
 pyroxmangite, 900
 rucklidgeite, 257
 skippenite, 257
 stibarsen, 257
 sulphotsumoite, 257
 TiO_2 (B), 343
 titanite, 370
 tremolite, fluor, 1811
 tremolite, OH, 1811
 volynskite, 257
 warwickite, 1380
 werdingite, 246
 Crystal structure models, 293
 Crystal synthesis
 α -spodumene, 42
 alkali feldspar, 1620
 anorthite, 148
 diopside, 148
 enstatite, 148
 feldspar, 1291
 grossular, 148
 petalite, 205, 1614
 phlogopite, 470
 phlogopite, $^{6,4}\text{Al}$ -rich, 1485
 pollucite, 1614
 pyrope, 49, 148
 quartz, 1291
 radtkeite, 1715
 spodumene, 611
 staurolite, 42
 yoderite, 1052
 Csiklovaite (= mixture of tetradymite,
 galenobismutite, and
 bismuthinite), 257
 Cumingtonite, 956, 971
 Dacite, 548, 1662
 Defect structures, 1467
 Dehydration
 heulandite-clinoptilolite, 1872
 Delaware
 sillimanite, 1597
 Descriptive Mineralogist Mentors,
 Notice, 308
 Dewindtite, 1728
 Diffusion, 743, 1950
 Diffusion, intergranular, 756
 Diopside, 148, 313, 904
 Diopside crystallization, 904
 Discredited minerals
 csiklovaite (= mixture of
 tetradymite, galenobismutite,
 and bismuthinite), 257
 selen-tellurium (= mixture of
 selenium and tellurium), 257
 Dissakisite-(Ce), 1990
 Dissolution, 211
 Dissolution experiments, free-drift,
 1889
 Distinguished Public Service Medal of
 the MSA
 acceptance of, 1744
 presentation of, 1743
 Dolomite, 713, 743
 Dolomite, ferroan, 659, 661
 Drill, 293
 DTA, TGA
 brushite, 1722
 hydroxylapatite, 1722
 kassite, 283
 phlogopite (synthetic), 1485
 taranakite, 1722
 10-Å phase, 106
 titanite, 370
 Dugganite, 1434
 Eclogite, 971, 1781
 Edenite, Mn-rich, 1431
 Editors, 1990 Report of the, 1750
 Efremovite, 299
 Elasticity, 733
 Elbaite, cuprian, 1479
 Electrical properties
 spinel, 405
 Electron diffraction
 actinolite and hornblende,
 coexisting, 1184
 amphibole, 971
 anatase, 343
 anorthite (synthetic), 1110, 1120
 asbestos, 1467
 biotite, 1205
 boromuscovite, 1998
 crocidolite, 1467
 cumingtonite, 971
 glaucophane, 971
 hematite, 1205
 kassite, 283
 minnesotaite, 1905
 quartz, α - β transition, 1018

- Electron diffraction, *cont.*
 rutile, 1205
 rutile-hematite intergrowths, 113
 TiO₂ (B), 343
 titanite, 370, 1205
 vesuvianite, 397
 zircon, 1510
- Electron microscopy
 actinolite and hornblende,
 exsolution between, 1184
 allanite, 589
 amphibole, exsolution
 microstructures in, 971
 anatase, 343
 anorthite (synthetic), 1110, 1120
 arsenopyrite, 1964
 asbestos, 1467
 awaruite, 1356
 barite, 1964
 biotite, 1205
 boromuscovite, 1998
 calcite, 1964
 chondrule, 1356
 clay minerals, 1964
 crocidolite, 1467
 enstatite, 148
 garnet, 493
 glauconite, 1973
 hematite, 1205
 hornblende, tschermakitic, 1446
 illite, 1973
 illite/smectite, 1973
 kassite, 283
 magnesio-hornblende (synthetic),
 1811
 magnetite, 1356
 olivine, 1356
 pentlandite, 1356
 plagioclase, 493
 pyribole, 1467, 1811
 pyrite, 1964
 pyrope, 148
 pyroxene, 1356
 quartz, 361, 1964
 quartz, α - β transition, 1018, 1459
 reaction direction, 1931
 rutile, 113, 1205
 TiO₂ (B), 343
 titanite, 370, 1205
 tremolite, 1811
 tremolite (synthetic), 1811
 vesuvianite, 397
 warwickite, 1380
- Electron microscopy, *cont.*
 zircon, 1510
- Electronic structure, 733
- Enclaves, mafic, 574
- Enstatite, 148
- Epidote, 176, 602, 628
- Equation of state
 CO₂, 1547
- Euchlorine, 299
- EXAFS
⁵¹Ni, 1777
 thorite, 60
 thorigummitite, 60
 uranothorite, 60
 zircon, 60
- Expansivity measurements
 MgAl₂O₄ (synthetic), 1455
- Experimental petrology
 Al₂SiO₅, stability of, 677
 amphibole, tremolitic, 1811
 anorthite, 148
 anorthoclase, 928
 CO₂, 1547
 calcium clinoamphibole, 985
 calibration, 1092
 diopside, 148
 enstatite, 148
 feldspar, 200
 garnet-ilmenite, 1580
 glass, high-*P*, 8
 granite, 1291
 grossular, 148
 ilmenite, 427
 kalsilite, 200
 leucite, 200
 magnesite, 1547
 multianvil development, 1092
 Or-An-Ks system, 200
 olivine, 427
 Pt-Fe alloy, 1940
 pegmatite, alkali-rich, 1614
 pegmatite, Li-rich granitic, 205,
 611
 periclase, 1547
 phlogopite + quartz, melting of,
 470
 plagioclase, 211
 pyrope, 148
 pyrope (synthetic), 49
 reaction progress, kinetics of, 128
 sanidine, 928
 solid solution, tremolite-
 tschermakite, 985
- Experimental petrology, *cont.*
 staurolite, 27
 tremolite, 1931
 tremolite (synthetic), 458
 uncertainties in, 128
 yoderite, 1052
- Exsolution
 amphibole, 971
 cummingtonite, 971
 glaucophane, 971
 spinodal decomposition, 1184
- Fe in Pt, diffusion of, 1940
- Fe-Pt partitioning, 1940
- FeRh₂S₄, 1728
- Fe-Ti oxide, 548
- Fe-Zn-S, 1038
- Fe₃O₄-MgFe₂O₄-MgAl₂O₄-FeAl₂O₄-
 FeCr₂O₄-MgCr₂O₄, 405
- Fayalite, 218, 1101
- Fayalite, manganoan, 288
- Feldspar, 200, 1261, 1291, 1646
- Fergusonite, 1261
- Fibrolite, 1597
- Financial Advisory Committee, 1990
 Report of the, 1750
- Finite strain theory, 1765
- Finland
 anthophyllite, 942
 cordierite, 942
 gedrite, 942
- Fission tracks, 83
- Flint, 1863
- Fluid inclusions
 anaglyphic filters, 657
 microscopy, three-dimensional,
 657
- Fluid-rock ratios, 713
- Fluids, 848
- Fluocerite, 1261
- Fold and thrust nappes, 689
- Former officers, medal recipients, and
 meeting places, list of, 1753
- Forsterite, 1101
- Fumarole, 1662
- Gabbro-diorite, 218
- Gallium albite, 92
- Garnet, 138, 148, 493, 756, 956,
 1033, 1061, 1153, 1223, 1431,
 1580, 1781, 1950
- Garnet amphibolite, 589, 756
- Garnet, grossular, 1153

- Garnet, grossular-andradite, 1319
 Garnet, H in, 1153
 Garnet, oscillatory zonation of, 1319
 Garnet, zoned, 493, 1781
 Garnet-biotite, 1781
 Garnet-clinopyroxene, 512
 Garnet-clinopyroxene-plagioclase-quartz, 148
 Garnet-ilmenite, 1580
 Garnet-orthopyroxene-plagioclase-quartz, 148
 Gedrite, 942, 956
 Geikielite, 427
 Geobarometry, 2009
 Al_2SiO_5 , 677
 amphibole, 1002, 1306
 clinopyroxene-plagioclase-quartz, 1328
 enclaves, mafic, 574
 garnet, 1223, 1781
 garnet-clinopyroxene, 512
 garnet-clinopyroxene-plagioclase-quartz, 148
 garnet-orthopyroxene-plagioclase-quartz, 148
 hornblende, 176
 pyroxene, 1950
 sphalerite, 1038
 uncertainties in, 128, 138
 Geochemistry
 allanite, 589
 amphibole, 1920
 analcime phenocryst, 189
 ankerite-dolomite, 857
 anorthosite, 1306, 1920
 ash-flow tuff, rhyolitic, 288
 biotite, 161
 calcite, 857
 clinopyroxene, 1141
 dissolution experiments, free-drift, 1889
 enclaves, mafic, 574
 fumarole, 1662
 garnet amphibolite, 589
 glass inclusions, 1628
 granite, 574
 granodiorite, 574
 granophyre, 1646
 illite, 1563
 monzodiorite, 1306
 muscovite, 1563
 Na-Li-Cs minerals, 1614
 petalite + albite + fluid, 205
 Geochemistry, *cont.*
 plagioclase, 211
 pumpellyite, manganooan, 241
 rhyolite, 1628
 spodumene + albite + fluid equilibrium, 611
 stable isotopes, 189
 thorite, U in, 60
 titanite, 548
 trachyandesite, 1306
 ultrabasic rocks, kyanite-bearing, 501
 ultrabasic rocks, staurolite-bearing, 501
 zircon, 60
 Geospeedometry, 530
 Geothermometry, 2009
 anorthoclase, 928
 apatite, 83
 biotite, 161
 clinopyroxene-plagioclase-quartz, 1328
 feldspar, 1261
 fission tracks, 83
 garnet, 1223, 1950
 garnet-biotite, 1781
 garnet-ilmenite, 1580
 hornblende, 176
 ilmenite, 427
 magnetite, 427
 olivine, 427
 plagioclase melt, 477
 pyroxene, 1950
 sanidine, 928
 sphalerite, 1038
 spinel-olivine, 827
 syenite, 218
 Germanium albite, 92
 Germany
 babingtonite, 892
 glauconite, 1973
 Gibbsite-like mineral, F-bearing, 2020
 Gillulyite, 653
 Girvasite, 665
 Glass, 189, 673
 Glass, high-*P*, 8
 Glass, hydration of, 189
 Glass inclusions, 1628
 Glass, orange, 773
 Glass, rhyolitic, 530
 Glauconite, 1973
 Glaucophane, 971
 Gneiss domes, 689
 Gneiss, mafic, 148
 Gneiss, pelitic, 493
 Graftonite, 1985
 Grandreefite, 278
 Granite, 176, 218, 574, 1279, 1291
 Granite phase equilibria, 1279
 Granite, S-type, 1674
 Granitoid, 574
 Granodiorite, 574
 Granophyre, 1646
 Granulite, 148, 1328
 Grechishchevite, 1728
 Greenschist to amphibolite facies, 689
 Grossular, 148, 313, 880, 1153
 Grunerite, 1502
 H, 189
 Hawaii
 bornite, 1363
 isocubanite, 1363
 pentlandite, 1363
 solid solution, monosulfide, 1363
 Hematite, 1205, 1442
 Heulandite-clinoptilolite, 1872
 Hexatestibiopanickelite, 2020
 High-pressure phases
 β -(MgFe)₂SiO₄, 1765
 brucite, 1769
 epidote, 176
 glass, 673
 kyanite, 501
 MgSiO₃, 673
 perovskite, 673
 phase AnhB, 1
 phase B, 1, 354
 pyrope, 49
 staurolite, 501
 stishovite, 733
 10-Å phase, 106
 wadsleyite, 1765
 wadsleyite (synthetic), 354
 yoderite, 1052
 Högbomite, 942, 956
 Högbomite-24R, 1728
 Hollingworthite, 1694
 Hornblende, 176, 218, 574, 956, 1184
 Hornblende, Al content in, 1002
 Hornblende, tschermakitic, 1446
 Hotsonite, 1728

- Hungary
 illite, 1973
 Hydromica, 1563
 Hydroxylapatite, 1722
- Idaho
 fibrolite, 1597
- Igneous petrology
 anorthoclase, 928
 anorthosite, 1306
 ash-flow tuff, 288
 basalt, 1940
 boninite, 1940
 boromuscovite, 1998
 dacite, 548
 enclaves, mafic, 574
 feldspar, 200
 gabbro-diorite, 218
 granite, 176, 218, 1291
 granite phase equilibria, 1279
 granite, S-type, 1674
 granitoid, 574
 intrusion, tholeiitic, 561
 kalsilite, 200
 lamprophyre, 189
 leucite, 200
 magma, felsic, 1279
 magma, lunar, 773
 melt, H₂O contents of, 477
 monzodiorite, 1306
 nickel-copper sulfide in basalt,
 1363
 pegmatite, Li-Nb-Ta, 1897
 pegmatite magma, eruptive, 1261
 phonolite, 189
 rapakivi, 1279
 rocks, alkalic, 189
 rocks, K-rich, 200
 sanidine, 928
 silicate melt structure, 8
 syenite, 218
 trachyandesite, 1306
 vapor exsolution, physics of, 1081
- Illite, 1563, 1973
 Illite/smectite, 1973
 Ilmenite, 427, 785, 956
- India
 babingtonite, 892
 pegmatite, 241
 pumpellyite, 241
 Ingodite, 257
 Intrusion, tholeiitic, 561
- Ion microprobe
 glass inclusions, 1628
- Ion probe, 189
 Ionic radii, 100
 Ir minerals, 1434
 IR spectroscopy
 andradite, 1249
 ashburtonite, 1701
 basalt glass, H₂O content of, 1940
 boromuscovite, 1998
 garnet, grossular, 1153
 glass, high-*P*, 8
 glass, rhyolitic, 530
 katoite, OH in, 1153
 micro-IR, 49
 milarite, 1836
 phase B, 354
 pyrope, 313
 quartz, 361
 richterite, (synthetic) Ti-rich
 potassic, 1134
 SiO₂ glass, 1761
 silicate glass, 1761
 titanite, 370
 wadsleyite (synthetic), 354
 zircon, 74, 1533
 zoisite, 313
- Ireland
 migmatite, 848
- Iridrhodruthenium, 1434
 Iron lithium staurolite, 42
 Ishikawaite, 1261
 Isocubanite, 1363
 Isotopes, radiogenic, 574
- Italy
 biotite, 1174
 brushite, 1722
 hydroxylapatite, 1722
 pitiglianoite, 2003
 taranakite, 1722
- Jadeite, 1328
- Japan
 akaganéite, 272
 babingtonite, 892
 thorogummite, 60
 zircon, 60
- Joséite, 257
 Joséite-B, 257
- K₂O-SiO₂, 8
 Kalsilite, 200
 Kassite, 283
- Katoite, OH in, 1153
 Kawazulite, 257
 Kazakhstanite, 665
 Keithconnite, 2020
 Kentrolite, 1389
- Kinetics
 anorthite, Al-Si ordering in, 1120
 anorthite, domain coarsening in,
 1110
 anorthoclase, 928
 apatite, 83
 bubble rise times, 1081
 diffusion, 1950
 diopside crystallization, 904
 fission tracks, 83
 garnet amphibolite, 756
 magma, percolation of fluids in,
 1081
 plagioclase, 211
 plagioclase and pyroxene, Al
 diffusion in, 1328
 quartz, α - β transition, 1459
 quartz crystallization, 1291
 reaction position, experimental
 location of, 128
 sanidine, 928
- Kochkarite, 1434
- Korea
 takanelite, 1426
- Kornerupine, 1824
 Kornerupine, B-free, 1824
 Kyanite, 313, 501, 1597
 Kyanite-sillimanite-andalusite, 677
- (Li-Na) aluminosilicate, 205
 (Li-Na)Cl, 205
 Li-Na-Cs-Al-Si-Cl, 1614
 Laitakarite, 257
 Lamproite, 1380
 Lamprophyre, 189
 Långbanite, 1408
 Lanthanide oxide sulfate, 278
 LAPW method, 733
 Lattice dynamics calculations
 andalusite, 313
 pyrope, 313
 zoisite, 313
- Lazurite, 1728
 LCLSQ, 663
 Leningradite, 1434
 Lesser Antilles
 epidote, 602

- Leucite, 189, 200, 313
 Levyclaudite, 2020
 Lintisite, 1728
 Lishizhenite, 2020
 Lithiowodginitite, 665
 Ludwigite, 1061
 Lüneburgite, 1400
- $MgAl_2O_4$ (synthetic), 1455
 $(Mg,Fe^{2+})(Al,Fe^{3+},Cr)_2O_4$ spinel, 405
 $[Mg(H_2O)_6]CsCl_3$, 1884
 $MgO-Al_2O_3-Fe_2O_3-SiO_2-H_2O$, 1052
 $MgSiO_3$, 673
 $Mg_3[SO_4]_2(OH)_2$, 2020
 MacSuite, 2013
 Madagascar
 thorite, 60
 zircon, 60
 Magma, basaltic, 785
 Magma, felsic, 1279
 Magma, lunar, 773
 Magma ocean, 773
 Magma, percolation of fluids in, 1081
 Magnesio-hornblende, 1811
 Magnesio-hornblende (synthetic), 1811
 Magnesite, 1547
 Magnesium cordierite, 313
 Magnesium zinnwaldite, 1728
 Magnetic properties
 minnesotaite, 1905
 talc, ferrous, 1905
 Magnetite, 427, 756, 785, 956, 1061, 1356
 Maine
 andalusite, 1597
 ankerite-dolomite, 857
 biotite, 161
 calcite, 857
 chlorite, 867
 metapelite, 161, 867
 Mangangordonite, 2020
 Manitoba
 clinopyroxene-plagioclase-quartz, 1328
 Marble, 1683, 1990
 Margarite, 1061
 Maria formation, 773
 Massachusetts
 amphibolite, 956
 babingtonite, 892
 garnet, 1781
- Massachusetts, *cont.*
 greenschist to amphibolite facies, 689
 pyroxene granulite, 956
 rocks, metamorphic, 689
 wollastonite marble, 1781
 Matildite, 257
 Mechanical properties
 elasticity, 733
 stishovite, 733
 viscosity, $Na_2Si_2O_5$ melt, 1449
 volume modulus, $Na_2Si_2O_5$, 1449
 Melilite, 1033
 Melt, H_2O contents of, 477
 Melt structure
 aluminosilicate, F-bearing, 309
 glass, high-*P*, 8
 $Na_2Si_2O_5$, 1449
 oxidation, 1560
 SiO_2 , 1761
 silicate, 1761
 viscosity, 1560
 Memorials
 Anderson, Charles A., 306
 Woodford, Alfred O., 2027
 Metacarbonate, amphibole in, 1002
 Metamict state, 60
 Metamictization, 74
 Metamorphic petrology
 Al_2SiO_5 , 677
 amphibole, 1920
 amphibolite, 956
 anchimetamorphism, 230
 ankerite-dolomite, 857
 anorthosite, 1920
 breccia contact, intrusive impact, 773
 calcite, 857
 cordierite-orthoamphibole, 942
 coronal textures, 756
 dolomite, 743
 fluid-rock ratios, 713
 fluids, 848
 garnet amphibolite, 589, 756
 garnet, zoned, 493
 granulite, 148, 1328
 hornblende, Al content in, 1002
 marble, 1990
 metamorphism, low-grade, 628
 metapelite, 867
 muscovite, 1563
 pelitic assemblages, 848
 plagioclase, 493
- Metamorphic petrology, *cont.*
 P-T-t paths, 1328
 pyroxene, 1344
 pyroxene granulite, 956
 rocks, metamorphic, 617
 schist, pelitic, 161
 serendibite, 1061
 skarn, magnesian, 1061
 staurolite, stability of, 42
 structural development, relations with, 689
 sulfide, massive, 1344
 talc, 743
 terranes, metamorphic, history of, 1781
 tourmaline, 1061
 tourmalinite, 681
 tremolite, 743
 triple point, aluminum silicate, 677
 ultrabasic rocks, kyanite-bearing, 501
 ultrabasic rocks, staurolite-bearing, 501
 yoderite, 1052
 Metamorphism, Acadian, 689
 Metamorphism, low-grade, 628
 Metapelite, 161, 867
 Metapelite, chloritoid-grade, 113
 Metasomatism, 743
 Meteorite, El Sarpal, 1985
 Mexico
 analcime, 189
 minette, 189
 trachyandesite, 1306
 Mgriite, 2020
 Mica, 681
 Mica, Cl-rich, 1683
 Micro-IR, 49
 Microscopy, three-dimensional, 657
 Microthermometry, 230
 Migmatite, 848
 Milarite, 1836
 Milarite group, 1836
 Milarite, yttrian, 1836
 Mineral analysis normalizations, 295
 Mineral Museums Advisory Council, Notice, 308
 Mineral surface structure
 hematite, 1442
 Mineralogical Society of America
 Award
 acceptance of, 1741
 presentation of, 1740

- Minette, 189
 Minnesotaite, 1905
 Monazite, 1261
 Mont Saint-Hilaire minerals, 299
 Montana
 granophyre, 1646
 Monticellite, 1101
 Monzodiorite, 1306
 Moon, origin of, 773
 Mössbauer spectroscopy
 ankerite, 659, 661
 babingtonite, 892
 biotite, 161
 columbite, Fe in, 1897
 dolomite, ferroan, 659, 661
 epidote, 602
 minnesotaite, 1905
 staurolite, 27
 talc, ferrous, 1905
 titanite, 370
 Mottramite, calcian, 1728
 Mullite, 332
 Mullite, incommensurate structure of, 332
 Multianvil development, 1092
 Muscovite, 713, 1205, 1563
 Muscovite, Ba-rich, 1683
 Muscovite-hydromuscovite, δD and $\delta^{18}O$ in, 1563

 N, 189
 NaAlSi₂O₆-NaF, 309
 NaAlSi₂O₆-Na₃AlF₆, 309
 Na-Li-Cs minerals, 1614
 Na₂O-CaO-MgO-FeO-Al₂O₃-SiO₂-H₂O, 617
 Na₂O-SiO₂, 8
 Na₂Si₂O₅, 1449
 Nd-Sm, 574
¹⁵Ni, 1777
 (Ni,Cu)₂Sb, 1434
 (Ni-Fe-Rh-Cu-Ir)S, 1434
 (Ni,Ir,Fe)S, 1434
 Ni₃Sb, 1434
 Ni₇As₃, 1434
 Nacaphite, 299
 Neutron diffraction
 MgAl₂O₄ (synthetic), 1455
 mullite, 332
 Nevada
 fayalite, manganoan, 288
 radtkite, 1715

 New England
 greenschist to amphibolite facies, 689
 rocks, metamorphic, 689
 stratigraphic, structural, and petrologic investigations, 689
 New Hampshire
 amphibolite, 956
 greenschist to amphibolite facies, 689
 rocks, metamorphic, 689
 New Jersey
 biotite, Ba-rich, 1683
 cianciullite, 1708, 1711
 marble, 1683
 muscovite, Ba-rich, 1683
 skarn, 1683
 New Mexico
 apatite, 1165, 1857
 staurolite, 1910
 tin rhyolite, 1628
 trachyandesite, 1306
 New mineral data (abstracts)
 algononite, 2020
 awaruite, 2020
 berborite polytypes, 1728
 berthierite, bismuthian, 2020
 billingsleyite, 2020
 bogdonovite, 2020
 dewindtite, 1728
 dugganite, 1434
 euchlorine, 299
 hexatestibiopanickelite, 2020
 högbomite-24R, 1728
 hotsonite, 1728
 keithconnite, 2020
 lazurite, 1728
 mgriite, 2020
 nacaphite, 299
 perllialite, 1728
 phosphuranylite, 1728
 platynite, 299
 polarite, 2020
 rhönite, 665
 roaldite, 2020
 sobolevite, 299
 sobolevskite, 2020
 stibiopalladinite, 2020
 stüttzite, 2020
 urvantsevite, 2020
 vinogradovite, 1728
 volborthite, 665
 wairauite, 2020

 New mineral data (abstracts), *cont.*
 weissite, 2020
 New minerals (abstracts)
 Ag_{1.5}Bi_{5.5}S₉, 665
 Ag_{3.5}Bi_{7.5}Si₁₃, 665
 Ag₉SbTe₂S₄, 665
 Ag₁₀FeTe₂S₄, 665
 AuPb₂BiTe₂S₃, 1434
 Au₃(Ag,Pb)As₂Te₃, 1434
 alluaivite, 1728
 ankangite, 2020
 anyuinite, 299
 astrocyanite-(Ce), 665
 Ba₃(Ti_{1.2}Nb_{4.8})Si₄O_{25.4}, 665
 barium titanosilicate, 1434
 belkovite, 1728
 bismuth ramdohrite, 2020
 bøgvadite, 1728
 burpalite, 665
 byelorussite-(Ce), 665
 (Cu,Fe)_{1-x}(Pd,Rh,Pt)_{2+x}S₂, 1434
 Cu(Pt,Ir,Rh)₂S₄, 1434
 calcio-ancylite-(Nd), 1728
 camgasite, 2020
 chiluite, 665
 clinobehoite, 665
 clinomimetite, 2020
 efremovite, 299
 FeRh₂S₄, 1728
 gibbsite-like mineral, F-bearing, 2020
 girvasite, 665
 grechishchevite, 1728
 Ir minerals, 1434
 iridrhodruthenium, 1434
 kazakhstanite, 665
 kochkarite, 1434
 leningradite, 1434
 levyclaudite, 2020
 lintisite, 1728
 lishizhenite, 2020
 lithiowodginite, 665
 Mg₃[SO₄]₂(OH)₂, 2020
 magnesium zinnwaldite, 1728
 mangangordonite, 2020
 Mont Saint-Hilaire minerals, 299
 mottramite, calcian, 1728
 (Ni,Cu)₂Sb, 1434
 (Ni-Fe-Rh-Cu-Ir)S, 1434
 (Ni,Ir,Fe)S, 1434
 Ni₃Sb, 1434
 Ni₇As₃, 1434
 Pb₄O₃(Cl,SO₄)₂, 1728

New minerals (abstracts), *cont.*

Pd(Sb,Te,Bi), 1434
 Pd₂(Cu,Ag)₂S₃, 1434
 Pd₂CuSb, 1434
 Pd₂Sb, 1434
 Pd₃(Te,As), 1728
 Pd₄Sb, 1434
 Pd₅Rh₅As₄, 1728
 Pd₈Te₃, 1434
 Pt oxide(?), 1434
 PtAs₂S₄, 1434
 Pt-Cu-Au alloy, 1434
 (Pt,Pd)₂PbSb, 1434
 (Pt,Pd)_{4+x}Cu₂As_{1-x}, 1434
 Pt₂Cu₃, 1434
 Pt₂(Ir,Os)Fe_{0.65}, 1434
 pengzhizhongite-6H, 1728
 perraultite, 299, 2020
 phyllosilicate, Zn-Te-Pb-Mn-bearing, 1434
 RhNiAs, 1434
 Rh₂Ni₃S₆, 1434
 Rh₂SnCu, 1434
 Rh₂Te₃, 1434
 Ru-Fe alloy, 1434
 Ru₃As, 1434
 rorisite, 1728
 rouvilleite, 2020
 Se-bearing minerals, 1728
 scandium microlite, 665
 silicon, 665
 silinaite, 2020
 strontio Piemontite, 665
 strontio whitlockite, 2020
 sulfate, ferric, 665
 svyatoslavite, 299
 szymańskiite, 1728
 titanian biotite-4M₃, 299
 titanium, 1434
 trimounsite-(Y), 2020
 tuliokite, 665
 unnamed BaMn(CO₃)₂, 299
 unnamed iron silicides, silicon, 299
 unnamed MnSi, Mn, 665
 unnamed (Ni,Fe,Co)AsS, 665
 unnamed Sr-Mg phosphate, 2020
 unnamed titanosilicate, 299
 vasilite, 1434
 ximengite, 1434
 xingsaoite, 665
 yakhontovite, 665
 yingjiangite, 1728

New minerals (abstracts), *cont.*

zanazziite, 1728
 zenzénite, 2020
 znucalite, 1728

New minerals (descriptions)

ashburtonite, 1701
 boromuscovite, 1998
 cianciulliite, 1708
 dissakisite-(Ce), 1990
 edenite, Mn-rich, 1431
 gillulyite, 653
 pitiglianoite, 2003
 radtkeite, 1715

New South Wales

babingtonite, 892

New York

amphibole, 1920
 anorthosite, 1920
 braunite, 1431
 edenite, Mn-rich, 1431
 sillimanite, 1597

New Zealand

clinopyroxene-plagioclase-quartz, 1328

Nickel-copper sulfide in basalt, 1363

NMR spectroscopy

²⁷Al, 309
 aluminosilicate glass, 309
 chalcedony, 1863
 cross-polarization, ¹⁹F -> ²⁷Al, 309
 flint, 1863
 glass, 673
 glass, high-*P*, 8
 MgSiO₃, 673
 opal, 1863
 perovskite, 673
 phlogopite (synthetic), 1485
 quartz, 1863
 titanite, 370

Norrishite, 266

North Carolina

columbite, 1897
 garnet, 148
 gneiss, mafic, 148
 plagioclase, 148
 pyroxene, 148
 spodumene pegmatite, 1897

Norway

babingtonite, 892
 biotite, 1174
 eclogite, 1781
 garnet, grossular-andradite, 1319
 thorite, 60

Norway, *cont.*

zircon, 60

Notices

Descriptive Mineralogist Mentors, 308

Mineral Museums Advisory Council, 308

U.S. National Mineral Collection, 308

Novaculite, 1597

O, 189

Or-An-Ks system, 200

Officers of MSA

Former officers, medal recipients, and meeting places, list of, 1753
 Officers and committees for 1991, 1756

Okhotskite, 241

Olivine, 218, 427, 1061, 1232, 1356

Ontario

clinopyroxene-plagioclase-quartz, 1328
 hollingworthite, 1694

Opal, 1863

Optical properties

anorthoclase, 928
 boromuscovite, 1998
 cianciulliite, 1708
 dissakisite-(Ce), 1990
 edenite, Mn-rich, 1431
 elbaite, cuprian, 1479
 gillulyite, 653
 pitiglianoite, 2003
 pumpellyite-(Mn²⁺), 241
 radtkeite, 1715
 rutile, 1205
 sanidine, 928
 titanite, 1205
 yoderite (synthetic), 1052
 zircon, 74, 1510

Optical spectroscopy

ashburtonite, 1701
 CaNiSi₂O₆, 1777
 elbaite, cuprian, 1479
 silicate glass, Ni in, 1777
 uranothorite, 60
 zircon, 74
 zircon, U in, 60

Order-disorder

amesite, 647
 amphibole, tremolitic (synthetic), 1811

Order-disorder, *cont.*

- anorthite, Al-Si ordering in, 1110
 anorthite, Al-Si ordering kinetics in, 1120
 anorthoclase, 928
 apatite, 1857
 apatite, rare-earth bearing, 1165
 biotite, 1174
 CO₃²⁻ disorder, 641
 calcite, magnesian, 641
 columbite, 1897
 epidote, 602
 Fe-Pt partitioning, 1940
 Fe₃O₄-MgFe₂O₄-MgAl₂O₄-FeAl₂O₄-FeCr₂O₄-MgCr₂O₄, 405
 gallium albite, 92
 garnet, grossular-andradite, 1319
 germanium albite, 92
 leucite, 313
 MgAl₂O₄ (synthetic), 1455
 magnesium cordierite, 313
 metamict state, 60
 mullite, 332
 olivine, 1232
 phlogopite (synthetic), 1485
 polysomatic series, 801
 pyribole, 1811
 quartz, α-β, 1459
 sanidine, 928
 titanite, 370, 1205
 vesuvianite, 397
 yoderite (synthetic), 1052
 zircon, metamict, 1510
- Ordering, incommensurate
 mullite, 332
- Oregon
 heulandite-clinoptilolite, 1872
 kassite, 283
- Orthoclase, 956
 Orthogneiss, 1205
 Orthopyroxene, 756, 785, 956, 1674
 Oxidation, 1560
 grunerite, 1502
- Pb₄O₃(Cl,SO₄)₂, 1728
 Pd(Sb,Te,Bi), 1434
 Pd₂(Cu,Ag)₂S₃, 1434
 Pd₂CuSb, 1434
 Pd₂Sb, 1434
 Pd₃(Te,As), 1728
 Pd₄Sb, 1434
 Pd₅Rh₅As₄, 1728
 Pd₈Te₃, 1434

- Pt oxide(?), 1434
 PtAs₂S₄, 1434
 Pt-Cu-Au alloy, 1434
 Pt-Fe alloy, 1940
 (Pt,Pd)₂PbSb, 1434
 (Pt,Pd)_{4+x}Cu₂As_{1-x}, 1434
 Pt₂Cu₃, 1434
 Pt₂(Ir,Os)Fe_{0.65}, 1434
 Paragenesis
 milarite, 1836
 Pargasite, 1061
 Pegmatite, 241
 Pegmatite accessory minerals, 1261
 Pegmatite, alkali-rich, 1614
 Pegmatite, granitic, 1998
 Pegmatite, Li-Nb-Ta, 1897
 Pegmatite, Li-rich granitic, 205, 611
 Pegmatite, mafic, 617
 Pegmatite magma, eruptive, 1261
 Pelite, 848, 867
 Pelitic assemblages, 848
 Pengzhizhongite-6H, 1728
 Pennsylvania
 apatite, 83
 babingtonite, 892
 quartz veins, 230
 Pentlandite, 1356, 1363
 Periclase, 1547
 Perliolite, 1728
 Perovskite, 673
 Perraultite, 299, 2020
 Petalite, 205, 1614
 Petalite + albite + fluid, 205
 Petalite + albite + quartz, 205
 Petalite-pollucite-quartz-albite, 1614
 Phase AnhB, Mg₁₄Si₅O₂₄, 1
 Phase B, 1, 354
 Phase B, Mg₁₂Si₄O₁₉(OH)₂, 1
 Phase equilibria
 alkali feldspar, 913
 aluminum silicate, 1563
 amphibole, Cl-rich, 1920
 amphibolite, 956
 andalusite-sillimanite-kyanite, 313
 annite, 218
 anorthite, 1061
 augite, 785
 biopyribole, 728
 C-O-H system, 713
 C-O-H-S, 1344
 CO₂, 1547
 CO₂-CH₄, 230
 CaO-Al₂O₃-Na₂O₄-SiO₂, 1328

Phase equilibria, *cont.*

- Cu-(Fe + Ni)-S system, 1363
 calcite, 1061
 calcium clin amphibole, 985
 clinopyroxene, 1061
 fayalite, 218
 feldspar, 200, 1291
 garnet, 1781
 granite, 1279
 ilmenite, 427, 785
 kalsilite, 200
 kyanite-sillimanite-andalusite, 677
 leucite, 200
 magma, basaltic, 785
 magnesite, 1547
 magnetite, 427, 785
 muscovite, 1563
 Or-An-Ks system, 200
 olivine, 427, 1232
 orthopyroxene, 785
 periclase, 1547
 petalite + albite + quartz, 205
 petalite-pollucite-quartz-albite, 1614
 phlogopite + quartz, stability of, 470
 pigeonite, 785
 plagioclase, 785
 plagioclase melt, 477
 quartz, 1018, 1291
 serendibite, 1061
 silicate-oxide-sulfide-graphite, 1344
 solid solution, tremolite-tschermakite, 985
 sphalerite-pyrrhotite-pyrite, 1038
 spinel, 827, 1061
 spodumene + albite + quartz, 611
 stability relations, 106
 staurolite, 27, 42
 10-Å phase, dehydration of, 106
 tourmaline, 1061
 tremolite, 458
 tremolite-diopside-enstatite-quartz-H₂O, 1931
- Phase transitions
 quartz, α-β, 1459
 Phlogopite, 470, 1061
 Phlogopite, ^[6,4]Al-rich, 1485
 Phlogopite + quartz, 470
 Phlogopite (synthetic), 1485
 Phonolite, 189
 Phosphuranylite, 1728

- Phyllosilicate, Zn-Te-Pb-Mn-bearing, 1434
- Pigeonite, 785
- Pitiglianoite, 2003
- Plagioclase, 138, 148, 211, 477, 493, 574, 617, 756, 785, 956, 1033, 1061, 1261, 1306, 1328
- Plagioclase and pyroxene, Al diffusion in, 1328
- Plagioclase feldspar, 713
- Plagioclase melt, 477
- Platynite, 257, 299
- Poland
- amesite, 647
- Polarite, 2020
- Pollucite, 1614
- Polymetamorphism
- pelite, 867
- Polysomatic series, 801, 900
- Polysomatism, 801
- Presidential Address for 1990, 1781
- Proceedings for 1990, 1746
- Protojosëite, 257
- P-T-t* path calculations, 2009
- P-T-t* paths, 1328
- Pumpellyite, 241
- Pyribole, 1467, 1811
- Pyrite, 1964
- Pyrope, 49, 148, 313, 880
- Pyrope (synthetic), 49
- Pyroxene, 148, 218, 1344, 1356, 1950
- Pyroxene granulite, 956
- Pyroxenoid, 900
- Pyroxmangite, 900
- Quantum mechanical calculations
- brucite, 1769
 - electronic structure, 733
 - LAPW method, 733
 - stishovite, 733
- Quartz, 361, 530, 1018, 1261, 1291, 1597, 1863, 1964
- Quartz, α - β , 1018, 1459
- Quartz crystallization, 1291
- Quartz, O in, 713
- Quartz veins, 230
- Quebec
- apatite, 1165
 - biotite, 1174
- Rb-Sr, 574
- RhNiAs, 1434
- Rh₂Ni₃S₆, 1434
- Rh₂SnCu, 1434
- Rh₂Te₃, 1434
- Ru-Fe alloy, 1434
- Ru₃As, 1434
- Radiation damage, 74, 370
- Radtkeite, 1715
- Raman spectroscopy
- andradite, 1249
 - aragonite, 641
 - CH₄, 230
 - CO₂, 230
 - calcite, magnesian, 641
 - fayalite, 1101
 - forsterite, 1101
 - glass, high-*P*, 8
 - monticellite, 1101
 - phase B, 354
 - richterite, (synthetic) Ti-rich potassic, 1134
 - SiO₂ glass, 1761
 - silicate glass, 1761
 - wadsleyite (synthetic), 354
- Rapakivi, 1279
- Reaction direction, 1931
- Reaction position, experimental
- location of, 128
- Reaction progress, kinetics of, 128
- Reactions, continuous
- amphibole, 617
 - plagioclase, 617
- RECALC2, 295
- REE
- allanite, 589
 - apatite, 1165, 1990
 - biotite, 1261
 - clinopyroxene, 1141
 - columbite, 1261
 - dissakisite-(Ce), 1990
 - feldspar, 1646
 - fergusonite, 1261
 - fluocerite, 1261
 - fumarole, 1662
 - granophyre, 1646
 - ishikawaite, 1261
 - milarite, yttrian, 1836
 - monazite, 1261
 - plagioclase, 1261
 - quartz, 1261
 - rhyolite, 1261
 - sanidine, 1261
 - thorite, 1261
 - titanite, 548
- REE, *cont.*
- topaz, 1261
 - ultrabasic rocks, kyanite-bearing, 501
 - ultrabasic rocks, staurolite-bearing, 501
 - zircon, 1261
- Replicas, freeze-etch, 1973
- Reports for 1990
- Editors, 1750
 - Financial Advisory Committee, 1750
 - Secretary, 1746
 - Treasurer, 1747
- Reviewers for *American Mineralogist* in 1990, 1750
- Rhönite, 665
- Rhyolite, 530, 1261, 1628
- Rhyolite glass, 288
- Rhyolite, major and trace elements, 1261
- Richterite, (synthetic) Ti-rich potassic, 1134
- Roaldite, 2020
- Rock and mineral classification, 2013
- Rocks, alkalic, 189
- Rocks, carbonatite-like, 1380
- Rocks, K-rich, 200
- Rocks, metamorphic, 617, 689
- Roebing Medal
- acceptance of, 1738
 - presentation of, 1736
- Rorisite, 1728
- Rouvilleite, 2020
- Rucklidgeite, 257
- Rutile, 113, 1205
- Rutile, Fe-bearing metamorphic, 113
- Rutile-hematite intergrowths, 113
- Se-bearing minerals, 1728
- SiO₂, 1761
- SiO₂ glass, 1761
- SiO₂-Al₂O₃-FeO-MgO-CaO-Na₂O-K₂O-H₂O-CO₂, 713
- Sanidine, 189, 928, 1261
- Saponite, 628
- Sarcopsidite, 1985
- Scandium microlite, 665
- Schist, calcareous, 713
- Schist, garnet-staurolite-grade, 113
- Schist, pelitic, 138, 161
- Secretary, 1990 Report of the, 1746

- Selen-tellurium (= mixture of selenium and tellurium), 257
- Serendibite, 1061
- Silicate, 1761
- Silicate glass, 1761, 1777
- Silicate melt, 1449
- Silicate melt structure, 8
- Silicate, rare-earth, 1990
- Silicate-oxide-sulfide-graphite, 1344
- Silicon, 665
- Silinaite, 2020
- Sillimanite, 313, 1597
- Sinhalite, 1061
- Skarn, 1683
- Skarn, magnesian, 1061
- Skippenite, 257
- Smectite-to-chlorite transformation, 628
- Sobolevite, 299
- Sobolevskite, 2020
- Sodalite, 1033
- Software notices
- crystal structure models, 293
 - Drill, 293
 - geobarometry, 2009
 - geothermometry, 2009
 - LCLSQ, 663
 - MacSuite, 2013
 - P-T-t* path calculations, 2009
 - RECALC2, 295
 - rock and mineral classification, 2013
- Solid solution, monosulfide, 1363
- Solid solution, pyrope-grossular, 313
- Solid solution, tremolite-tschermakite, 985
- Solubility, calcite, 1889
- Solution models
- olivine, 1232
- South Africa
- chromite, 561
 - clinopyroxene, 1141
 - garnet, 1950
 - pegmatite, mafic, 617
 - pyroxene, 1950
 - werdingite, 246
 - zircon, 1533
- Spain
- andradite, 1249
 - biotite, 1174
 - kyanite, 501
 - lamproite, 1380
 - rocks, carbonatite-like, 1380
- Spain, *cont.*
- staurolite, 501
- Sphalerite, 1038
- Sphalerite-pyrrhotite-pyrite, 1038
- Spinel, 405, 827, 956, 1033, 1061
- Spinel-olivine, 827
- Spinodal decomposition, 1184
- Spodumene, 611
- Spodumene + albite + fluid equilibrium, 611
- Spodumene + albite + quartz, 611
- Spodumene pegmatite, 1897
- Sri Lanka
- sillimanite, 1597
 - zircon, 74, 1510
- Stability relations, 106
- Stable isotopes, 189
- ankerite-dolomite, 857
 - calcite, 857
 - carbonate, 713
 - dacite, 548
 - H, 189
 - muscovite-hydromuscovite, δD and $\delta^{18}O$ in, 1563
 - N, 189
 - O, 189
 - quartz, O in, 713
- Staurolite, 27, 42, 501, 1910
- Stibarsen, 257
- Stibiopalladinite, 2020
- Stishovite, 733
- STM
- hematite, 1442
- Stratigraphic, structural, and petrologic investigations, 689
- Strontio piemontite, 665
- Strontio whitlockite, 2020
- Structural development, relations with, 689
- Structural geology
- fold and thrust nappes, 689
 - gneiss domes, 689
- Structure-energy calculations
- akaganéite, 272
 - andalusite, 313
 - biopyribole, 728
 - cordierite, 313
 - diopside, 313
 - grossular, 313
 - kyanite, 313
 - leucite, 313
 - pyrope, 313
 - sillimanite, 313
- Structure-energy calculations, *cont.*
- stishovite, 733
 - zoisite, 313
- Stützite, 2020
- Sulfate, ferric, 665
- Sulfide, massive, 1344
- Sulfide, metal excess Fe-rich, 1363
- Sulfide ores, 1038
- Sulphotsumoite, 257
- Svyatoslavite, 299
- Sweden
- babingtonite, 892
 - eclogite, 1781
 - kontrolite, 1389
 - långbanite, 1408
- Switzerland
- anatase, 343
 - TiO₂ (B), 343
- Syenite, 218
- Systems (chemical)
- Al₂SiO₅, 677
 - aluminosilicate-(Li-Na)Cl, 611
 - C-O-H-S, 1344
 - CaO-MgO-Al₂O₃-SiO₂, 148
 - CaO-MgO-Al₂O₃-SiO₂-B₂O₃-H₂O-CO₂, 1061
 - CaO-MgO-SiO₂-H₂O-CO₂, 743
 - Cu-Fe-Zn-S, 1038
 - clinopyroxene, 1033
 - CMSH, 1931
 - Fe-Zn-S, 1038
 - garnet, 1033
 - K₂O-SiO₂, 8
 - (Li-Na) aluminosilicate, 205
 - (Li-Na)Cl, 205
 - Li-Na-Cs-Al-Si-Cl, 1614
 - (Mg,Fe²⁺)(Al,Fe³⁺,Cr)₂O₄ spinel, 405
 - MgO-Al₂O₃-Fe₂O₃-SiO₂-H₂O, 1052
 - melilite, 1033
 - NaAlSi₂O₆-NaF, 309
 - NaAlSi₂O₆-Na₃AlF₆, 309
 - Na₂O-CaO-MgO-FeO-Al₂O₃-SiO₂-H₂O, 617
 - Na₂O-SiO₂, 8
 - plagioclase, 1033
 - SiO₂-Al₂O₃-FeO-MgO-CaO-Na₂O-K₂O-H₂O-CO₂, 713
 - sodalite, 1033
 - spinel, 1033
 - vector representation, 1033
- Szymańskiite, 1728

- Ti, tetrahedrally coordinated, 1134
 TiO₂, 113
 TiO₂ (B), 343
 Taiwan
 biotite, 1205
 orthogneiss, 1205
 Takanelite, 1426
 Talc, 458, 743, 1589
 Talc, ferrous, 1905
 Tanzania
 clinopyroxene-plagioclase-quartz,
 1328
 Taranakite, 1722
 10-Å phase, 106
 Tennessee
 pyroxene, 1344
 sulfide ores, 1038
 Terranes, metamorphic, history of,
 1781
 Tetradymite, galenobismutite, and
 bismuthinite, mixture of, 257
 Texas
 anorthosite, 1306
 garnet amphibolite, 756
 trachyandesite, 1306
 Thailand
 zircon, 1533
 Thermodynamic data
 albite, 1328
 alkali feldspar, 913
 andalusite, 1597
 andradite, 1249
 anorthite, 1120
 anorthite + diopside = grossular +
 pyrope + quartz, 148
 anorthite + enstatite = pyrope +
 grossular + quartz, 148
 anorthite quartz, 1328
 anorthoclase, 928
 anthophyllite, 1589
 aragonite, 1547
 boehmite, 445
 CO₂, 1547
 calcite, 1547
 calcite-IV, 1547
 calcite-V, 1547
 CATS, 1328
 diopside, 904
 fibrolite, 1597
 garnet, 1223, 1580
 grossular, 880
 hydromica, 1563
 ilmenite, 427
 Thermodynamic data, *cont.*
 jadeite, 1328
 kyanite, 1597
 (Mg,Fe²⁺)(Al,Fe³⁺,Cr)₂O₄ spinel,
 405
 magnesite, 1547
 magnetite, 427
 olivine, 427
 pyrope, 880
 quartz, 1597
 sanidine, 928
 sillimanite, 1597
 solid solution, pyrope-grossular,
 313
 solubility, calcite, 1889
 sphalerite, 1038
 spinel, 827
 talc, 458, 1589
 10-Å phase, 106
 tremolite, 458, 1931
 tschermakite, 1002
 Thompson issue, 685
 Thomsonite, 1061
 Thorite, 60, 1261
 Thorogummite, 60
 Tin rhyolite, 1628
 Titanian biotite-4M₃, 299
 Titanite, 370, 548, 1205
 Titanium, 1434
 Topaz, 1261
 Tourmaline, 681, 1061
 Tourmaline, cuprian, 1479
 Tourmalinite, 681
 Trace elements
 allanite, 589
 anorthosite, 1306
 biotite, 1261
 clinopyroxene, 1141
 columbite, 1261
 feldspar, 1646
 fergusonite, 1261
 fluocerite, 1261
 fumarole, 1662
 garnet amphibolite, 589
 garnet, H in, 1153
 granophyre, 1646
 ishikawaite, 1261
 monazite, 1261
 monzodiorite, 1306
 plagioclase, 1261
 pyrite, Au in, 1964
 quartz, 1261
 rhyolite, 1261
 Trace elements, *cont.*
 sanidine, 1261
 thorite, 1261
 topaz, 1261
 trachyandesite, 1306
 ultrabasic rocks, kyanite-bearing,
 501
 ultrabasic rocks, staurolite-bearing,
 501
 zircon, 60, 1261, 1533
 Trachyandesite, 1306
 Trachyte, 189
 Treasurer, 1990 Report of the, 1747
 Tremolite, 458, 713, 743, 1811,
 1931
 Tremolite, fluor, 1811
 Tremolite, OH, 1811
 Tremolite (synthetic), 458, 1811
 Tremolite-diopside-enstatite-quartz-
 H₂O, 1931
 Trimounsite-(Y), 2020
 Triple point, aluminum silicate, 677
 Tschermakite, 1002
 Tuliokite, 665
 Ultrabasic rocks, kyanite-bearing,
 501
 Ultrabasic rocks, staurolite-bearing,
 501
 Unit-cell data
 akaganéite, 272
 albite, 1646
 alkali feldspar, 913
 amesite, 647
 andradite, 1249
 anorthite, 148
 anorthite (synthetic), 1120
 anorthoclase, 928
 apatite, 1857
 ashburtonite, 1701
 beusite, 1985
 biotite, 1174
 bohdanowiczite, 257
 boromuscovite, 1998
 cianciulliite, 1708, 1711
 clinopyroxene, 1141
 columbite, 1897
 diopside, 148
 dissakisite-(Ce), 1990
 edenite, Mn-rich, 1431
 enstatite, 148
 gallium albite, 92

Unit-cell data, *cont.*

geikielite, 427
 germanium albite, 92
 gillulyite, 653
 grandreefite, 278
 grossular, 148
 grunerite, 1502
 heulandite-clinoptilolite, 1872
 ilmenite, 427
 iron lithium staurolite, 42
 kassite, 283
 kentrolite, 1389
 kornerupine, B-free, 1824
 långbanite, 1408
 lüneburgite, 1400
 MgAl₂O₄ (synthetic), 1455
 [Mg(H₂O)₆]CsCl₃, 1884
 matildite, 257
 milarite, 1836
 milarite, yttrian, 1836
 norrishite, 266
 phase AnhB, 1
 phase B, 1
 phlogopite, 470
 phlogopite (synthetic), 1485
 pitiglianoite, 2003
 protojosëite, 257
 pumpellyite-(Mn²⁺), 241
 pyrope, 148
 pyrope (synthetic), 49
 radteite, 1715
 richterite, (synthetic) Ti-rich
 potassic, 1134
 sanidine, 928
 sphalerite, 1038
 takanelite, 1426
 titanite, 370
 warwickite, 1380
 yoderite (synthetic), 1052
 zircon, 74, 1510
 zircon, crystalline to metamict, 60

Unit-cell parameter refinement, 663

Unnamed BaMn(CO₃)₂, 299

Unnamed iron silicides, silicon, 299

Unnamed minerals

Ag_{1.5}Bi_{3.5}S₉, 665
 Ag_{3.5}Bi_{7.5}Si₁₃, 665
 Ag₉SbTe₂S₄, 665
 Ag₁₀FeTe₂S₄, 665
 AuPb₂BiTe₂S₃, 1434
 Au₃(Ag,Pb)As₂Te₃, 1434
 Ba₃(Ti_{1.2}Nb_{4.8})Si₄O_{25.4}, 665
 (Cu,Fe)_{1-x}(Pd,Rh,Pt)_{2+x}S₂, 1434

Unnamed minerals, *cont.*

Cu(Pt,Ir,Rh)₂S₄, 1434
 FeRh₂S₄, 1728
 gibbsite-like mineral, F-bearing,
 2020
 Ir minerals, 1434
 Mg₃[SO₄]₂(OH)₂, 2020
 Mont Saint-Hilaire minerals, 299
 (Ni,Cu)₂Sb, 1434
 (Ni-Fe-Rh-Cu-Ir)₂S, 1434
 (Ni,Ir,Fe)₂S, 1434
 Ni₃Sb, 1434
 Ni₇As₃, 1434
 Pb₄O₃(Cl,SO₄)₂, 1728
 Pd(Sb,Te,Bi), 1434
 Pd₂(Cu,Ag)₂S₃, 1434
 Pd₂CuSb, 1434
 Pd₂Sb, 1434
 Pd₃(Te,As), 1728
 Pd₄Sb, 1434
 Pd₅Rh₅As₄, 1728
 Pd₈Te₃, 1434
 Pt oxide(?), 1434
 PtAs₂S₄, 1434
 Pt-Cu-Au alloy, 1434
 (Pt,Pd)₂PbSb, 1434
 (Pt,Pd)_{4+x}Cu₂As_{1-x}, 1434
 Pt₂Cu₃, 1434
 Pt₂(Ir,Os)Fe_{0.65}, 1434
 phyllosilicate, Zn-Te-Pb-Mn-
 bearing, 1434
 RhNiAs, 1434
 Rh₂Ni₃S₆, 1434
 Rh₂SnCu, 1434
 Rh₂Te₃, 1434
 Ru-Fe alloy, 1434
 Ru₃As, 1434
 Se-bearing minerals, 1728
 silicate, rare-earth, 1990
 TiO₂ (B), 343
 unnamed BaMn(CO₃)₂, 299
 unnamed iron silicides, silicon,
 299
 unnamed MnSi, Mn, 665
 unnamed (Ni,Fe,Co)AsS, 665
 unnamed Sr-Mg phosphate, 2020
 unnamed titanosilicate, 299
 Unnamed MnSi, Mn, 665
 Unnamed (Ni,Fe,Co)AsS, 665
 Unnamed Sr-Mg phosphate, 2020
 Unnamed titanosilicate, 299
 Uranothorite, 60
 Urvantsevite, 2020

U.S. National Mineral Collection,
Notice, 308

USSR

apatite, 1857
 serendibite, 1061
 skarn, magnesian, 1061

Utah

gillulyite, 653
 pegmatite accessory minerals,
 1261
 rhyolite, 1261
 topaz, 1261

Vapor exsolution, physics of, 1081

Vasilite, 1434

Vector representation, 1033

Vermont

blueschist, 971
 breccia, explosion, 218
 chlorite, 113
 eclogite, 971
 greenschist to amphibolite facies,
 689
 metacarbonate, amphibole in, 1002
 metapelite, chloritoid-grade, 113
 rocks, metamorphic, 689
 rutile, 113
 schist, calcareous, 713
 schist, garnet-staurolite-grade, 113
 syenite, 218

Vesuvianite, 397

Vinogradovite, 1728

Virginia

albite, 1773
 babingtonite, 892

Viscosity, 1560

Viscosity, Na₂Si₂O₅ melt, 1449

Volborthite, 665

Volcanology, 530

Volume modulus, Na₂Si₂O₅, 1449

Volynskite, 257

Wadsleyite, 1765

Wadsleyite, H₂O in, 354

Wadsleyite (synthetic), 354

Wairauite, 2020

Warwickite, 1380

Washington

gneiss, pelitic, 493

Weissite, 2020

Werdingtonite, 246

Western Australia

ashburtonite, 1701

Western Australia, *cont.*

crocidolite, 1467

Wollastonite marble, 1781

Woodford, Alfred O., Memorial of,
2027

Wyoming

amphibolite, 1184

XANES, 370, 1777

Ximengite, 1434

Xingsaoite, 665

XRD data

akaganéite, 272

andradite, 1249

anorthite, 148

ashburtonite, 1701

boromuscovite, 1998

chalcedony, 1863

chlorite, 628

chlorite, d_{001} vs. composition,
1373chlorite-saponite, mixed-layered,
628

cianciulliite, 1708

corrensite, 628

diopside, 148

dissakisite-(Ce), 1990

XRD data, *cont.*

elbaite, cuprian, 1479

enstatite, 148

flint, 1863

fumarole, 1662

gillulyite, 653

glaucosite, 1973

grossular, 148

illite, 1973

iron lithium staurolite, 42

kassite, 283

opal, 1863

phlogopite, 470

pitiglianoite, 2003

pyrope, 148

quartz, 1863

radtkeite, 1715

reaction direction, 1931

saponite, 628

TiO₂ (B), 343

takanelite, 1426

titanite, 370

unit-cell parameter refinement, 663

wadsleyite (synthetic), 354

zircon, 1510

zircon, crystalline to metamict, 74

XRF data

boromuscovite, 1998

dacite, 548

feldspar, 1646

fumarole, 1662

garnet amphibolite, 589

granophyre, 1646

rhyolite, major and trace elements,
1261

Yakhontovite, 665

Yingjiangite, 1728

Yoderite, 1052

Yoderite (synthetic), 1052

Yugoslavia

lüneburgite, 1400

Zanazziite, 1728

Zenzénite, 2020

Zimbabwe

korerupine, B-free, 1824

Zircon, 60, 74, 1261, 1510, 1533

Zircon, crystalline to metamict, 60,
74

Zircon, metamict, 1510

Znucalite, 1728

Zoisite, 313