

THE AMERICAN MINERALOGIST

Journal of the Mineralogical Society of America

CONTENTS, VOLUME 63

January, February 1978

Numbers 1 and 2

Superstructuring in the bornite–digenite series: a high-resolution electron microscopy study	Larry Pierce and Peter R. Buseck	1
Characters of quartz fibers	Clifford Frondel	17
The crystal structure of loveringite—a new member of the crichtonite group	Bryan M. Gatehouse, Ian E. Grey, Ian H. Campbell and Patrick Kelly	28
An unusual titanium-rich oxide mineral from the Eastern Bushveld Complex	Eugene N. Cameron	37
Phase equilibria in fluid inclusions in ultramafic xenoliths	Barbara W. Murck, Robert C. Burruss and Lincoln S. Hollister	40
Mineralogy of the Elwin Bay kimberlite, Somerset Island, N.W.T., Canada	Roger H. Mitchell	47
Synthesis, composition, thermal stability, and thermodynamic properties of bicchulite, $\text{Ca}_2[\text{Al}_2\text{SiO}_6](\text{OH})_2$	Alok K. Gupta and Niranjan D. Chatterjee	58
Compositions and unit-cell parameters of synthetic non-stoichiometric tschermakitic clinopyroxenes	Bernard J. Wood and C. M. B. Henderson	66
The stability of clinocllore + quartz at low pressure	Joseph V. Chernosky, Jr.	73
The use of thermodynamic excess functions in the Nernst distribution law	Norman B. Holst, Jr.	83
Calculation of metamorphic pressure using the sphalerite–pyrrhotite–pyrite equilibrium	Ian Hutcheon	87
Pyrophyllite and metamorphism in the Carolina slate belt	Martha L. Sykes and Judith B. Moody	96
Low-temperature heat capacities and entropies of feldspar glasses and of anorthite	Richard A. Robie, Bruce S. Hemingway and William H. Wilson	109
Intensity differences of subsidiary reflections in calcic plagioclase	Clifford S. Rainey and Hans-Rudolf Wenk	124
Ordering of the intermediate plagioclase structure during heating	Hans-Rudolf Wenk	132
Exsolution in potassium–calcium feldspars: experimental evidence and relationship to antiperthites and Bøggild lamellae	Suzanne Mahlborg Kay	136
Plagioclase compositions from metabasalts, southeastern Llano Uplift: plagioclase unmixing during amphibolite-grade metamorphism	James R. Garrison, Jr.	143
Hematolite: a complex dense-packed sheet structure	Paul B. Moore and Takaharu Araki	150
Ulexite, $\text{NaCaB}_3(\text{OH})_6 \cdot 5\text{H}_2\text{O}$: structure refinement, polyanion configuration, hydrogen bonding, and fiber optics	Subrata Ghose, Che'ng Wan and Joan R. Clark	160
Salesite, $\text{CuIO}_3(\text{OH})$, and $\text{Cu}(\text{IO}_3)_2 \cdot 2\text{H}_2\text{O}$: a comparison of the crystal structures and their magnetic behavior	Subrata Ghose and Che'ng Wan	172
The crystal structure of paramelaconite, Cu_4O_3	M. O'Keeffe and J.-O. Bovin	180
Refinement of the margarite structure in subgroup symmetry: correction, further refinement, and comments	Stephen Guggenheim and S. W. Bailey	186
Gadolinite-(Ce) from Skien, southwestern Oslo region, Norway	Tom Victor Segalstad and Alf Olav Larsen	188
Hydroxyapophyllite, a new mineral, and a redefinition of the apophyllite group		
I. Description, occurrences, and nomenclature	Pete J. Dunn, Roland C. Rouse and Julie A. Norberg	196
II. Crystal structure	Roland C. Rouse, Donald R. Peacor and Pete J. Dunn	199
Three-layer monoclinic lepidolite from Tørdal, Norway	S. W. Bailey and Olav H. J. Christie	203
Coexisting amphiboles from the Noranda area, Quebec: extension of the actinolite hornblende miscibility gap to iron-rich bulk composition	John M. Allen and Raymond Goldie	205
Epitaxial marcasite on pyrite from Rensselaer, Indiana	Kenneth J. Brock and Larry D. Slater	210
New data on stranskiite from Tsumeb, Southwest Africa	Henry A. Hänni, Willem B. Stern and Martin Glor	213
BOOK REVIEWS		216
NOTICES		217

March, April 1978

Numbers 3 and 4

The origins of color in minerals	Kurt Nassau	219
Growth-induced radiation-developed pleochroic anisotropy in smoky quartz	Kurt Nassau and Betty E. Prescott	230
Biopyriboles and polysomatic series	James B. Thompson, Jr.	239
Sphalerite geobarometry in the Balmat-Edwards district, New York	P. E. Brown, E. J. Essene and W. C. Kelly	250

Pyroxene-ilmenite intergrowths in garnet pyroxenite xenoliths from a New York kimberlite and Arizona latites	<i>Daniel J. Schulze, Herwart Helmstaedt and Robert M. Cassie</i>	258
Natural hydration and ion exchange of obsidian: an electron microprobe study	<i>Peter A. Jezek and Donald C. Noble</i>	266
The role of octahedral cations in pyroxenoid crystal chemistry. I. Bustamite, wollastonite, and the pectolite-schizolite-serandite series	<i>Yoshikazu Ohashi and Larry W. Finger</i>	274
The crystal structures and compressibilities of layer minerals at high pressure. I. SnS_2 , berndtite	<i>Robert M. Hazen and Larry W. Finger</i>	289
The crystal structures and compressibilities of layer minerals at high pressure. II. Phlogopite and chlorite	<i>Robert M. Hazen and Larry W. Finger</i>	293
Crystal structures and compressibilities of pyrope and grossular to 60 kbar	<i>Robert M. Hazen and Larry W. Finger</i>	297
Zektzerite, $\text{NaLiZrSi}_6\text{O}_{15}$: a silicate with six-tetrahedral-repeat double chains	<i>Subrata Ghose and Che'ng Wan</i>	304
Crystal structure refinement of lawsonite	<i>Werner H. Baur</i>	311
Biaxiality in 'isometric' and 'dimetric' crystals	<i>Eugene E. Foord and Bradford A. Mills</i>	316
Diaspore recrystallized at low temperature	<i>W. D. Keller</i>	326
Allanite in charnockites from Air Port Hill, Visakhapatnam, Andhra Pradesh, India	<i>A. T. Rao and V. R. R. M. Babu</i>	330
The crystal structure of a 3T lepidolite	<i>Bruce E. Brown</i>	332
A revised method of operation of the single-crystal diamond cell and the refinement of the structure of NaCl at 32 kbar	<i>Larry W. Finger and Hubert King</i>	337
Infrared spectra of synthetic micas in the series muscovite-MgAl celadonite	<i>B. Velde</i>	343
The system $\text{Mg}_2\text{SiO}_4\text{-Fe}_2\text{SiO}_4\text{-CaAl}_2\text{Si}_2\text{O}_8\text{-SiO}_2$ and the origin of Fra Mauro basalts	<i>Bruce R. Lipin</i>	350
High-temperature structural study of six olivines	<i>George A. Lager and E. P. Meagher</i>	365
The low-temperature stability of andradite in C-O-H fluids	<i>Bruce E. Taylor and Juhn G. Liou</i>	378
Measurement of refractive indices and their dispersion	<i>S. John Louisnathan, F. Donald Bloss and E. J. Korda</i>	394
Hydrothermal reactivity of smectite	<i>Dennis Eberl, Gene Whitney and Hani Khoury</i>	401
Albrittonite, a new cobalt chloride hydrate from Oxford, Llano County, Texas	<i>Wilson W. Crook, III and Louise-Annette Marcotty</i>	410
Arfvedsonite in basalt dykes, Buchans, Newfoundland	<i>R. W. Henley</i>	413
The preparation of starting mixes for mineral syntheses by a freeze-dry technique	<i>Tony A. Finnerty, G. A. Waychunas and Warren M. Thomas</i>	415
Simultaneous crystallization of feldspar intergrowths from the melt: a discussion	<i>S. A. Morse and Gary E. Lofgren</i>	419
Differential reaction analysis (DRA)—a technique for obtaining differential thermal analysis data from inert substances: a discussion	<i>D. E. Rogers</i>	422
Differential reaction analysis (DRA)—a technique for obtaining differential thermal analysis data from inert substances: a reply	<i>Otto C. Kopp</i>	423
NEW MINERAL NAMES		424
BOOK REVIEWS		428
NOTICES		432

May, June 1978

Numbers 5 and 6

The spindle stage: a turning point for optical crystallography	<i>F. Donald Bloss</i>	433
Is each analcime different?	<i>Fiorenzo Mazzi and Ermanno Galli</i>	448
Virgilite: a new lithium aluminum silicate mineral from the Macusani glass, Peru	<i>Bevan M. French, Peter A. Jezek and Daniel E. Appleman</i>	461
Extinction angles of synthetic intermediate albites	<i>Peter Raase</i>	466
Kinetics of lamellar coarsening in cryptoperthites	<i>Richard A. Yund and Paula Davidson</i>	470
Guildite, a layer structure with a new type of ferric hydroxy-sulphate chain and its optical absorption spectra	<i>Che'ng Wan, Subrata Ghose and George R. Rossman</i>	478
Brindleyite, a nickel-rich aluminous serpentine mineral analogous to berthierine	<i>Z. Maksimovic and David L. Bish</i>	484
The site distribution of iron and anomalous biaxiality in osumilite	<i>Don S. Goldman and George R. Rossman</i>	490
Chevkinite and perrierite from the Oslo region, Norway	<i>Tom Victor Segalstad and Alf Olav Larsen</i>	499
Crystal structures and sulphate force constants of barite, celestite, and anglesite	<i>Michihiro Miyake, Ichiro Minato, Hideki Morikawa and Shin-ichi Iwai</i>	506
Experimental determination of univariant equilibria using divariant solid-solution assemblages	<i>Rolf Schmid, Gordon Cressey and Bernard J. Wood</i>	511
Experimental extension of the sphalerite geobarometer to 10 kbar	<i>John Lusk and C. E. Ford</i>	516
The crystal structure of synthetic calcium phosphate-sulfate hydrate, $\text{Ca}_2\text{HPO}_4\text{SO}_4 \cdot 4\text{H}_2\text{O}$, and its relation to brushite and gypsum	<i>Toshiro Sakae, Hiroshi Nagata and Toshio Sudo</i>	520
Kalipyrochlore, a new mineral of the pyrochlore group	<i>L. Van Wambeke</i>	528
Magmatic trends on alkali-iron-magnesium diagrams	<i>Daniel S. Barker</i>	531
Crystal chemistry of titanian chondrodite and titanian clinohumite of high-pressure origin	<i>Kiyoshi Fujino and Yoshio Takeuchi</i>	535
Manganian magnesian ilmenite and titanian clinohumite from the Jacupiranga carbonatite, São Paulo, Brazil	<i>Roger H. Mitchell</i>	544
Study of the glide elements in pyrite by means of electron microscopy and electron diffraction	<i>Ludo Van Goethem, Joseph Van Landuyt and Severin Amelinckx</i>	548

The biotite-apatite geothermometer revisited.....	Steve Ludington	551
Occurrence of dickite in Jamaica—ordered and disordered varieties.....	G. W. Brindley and Anthony R. D. Porter	554
Inesite, a hydrated calcium manganese silicate with five-tetrahedral-repeat double chains.....	Che'ng Wan and Subrata Ghose	563
Long-range organization in the ammonium propionate intercalation complexes of kaolinite	H. Seto, M. I. Cruz and J. Fripiat	572
Ion microprobe mass analysis of exsolution lamellae in labradorite feldspar	Yasunori Miura and Takeshi Tomisaka	584
Hydrostatic compression of iron and related compounds: an overview.....	David R. Wilburn and William A. Bassett	591
Correction to the paper "Compositional variations of coexisting phases with degree of melting of peridotite in the upper mantle" by B. O. Mysen and I. Kushiro.....	Dean C. Presnall, Bjørn O. Mysen and Ikuo Kushiro	597
NEW MINERAL NAMES.....		598
NOTICES.....		600
AWARDS		
Presentation of the Roebling Medal of the Mineralogical Society of America for 1977 to Raimond Castaing	Klaus Keil	601
Acceptance of the Roebling Medal of the Mineralogical Society of America for 1977	Raimond Castaing	602
Presentation of the Mineralogical Society of America Award for 1977 to J. G. Liou	W. Gary Ernst	604
Acceptance of the Mineralogical Society of America Award for 1977.....	Juhn G. Liou	605
MEMORIALS		
Memorial of Joseph W. Greig 1895–1977	MacKenzie L. Keith	607
PROCEEDINGS		
Proceedings of the Fifty-eighth Annual Meeting of the Mineralogical Society of America in Seattle, Washington.....	Larry W. Finger	610
Report of the Secretary for 1977.....	Larry W. Finger	611
Report of the Treasurer for 1977	Malcolm Ross	611
Report of the MSA Financial Advisory Committee for 1977	S. W. Bailey, P. M. Bethke, E. F. Osborn, D. W. Rankin, M. Ross and P. Toulmin, 3rd	613
Report of the Editor.....	Brian Mason	614
LIST OF FORMER OFFICERS AND MEETING PLACES		616
LIST OF OFFICERS AND COMMITTEES.....		619

July, August 1978

Numbers 7 and 8

Mineral parageneses of eclogitic rocks and related mafic schists of the Piemonte ophiolite nappe, Breuil-St. Jacques area, Italian Western Alps.....	W. G. Ernst and G. V. Dal Piaz	621
Phase compositions through crystallization intervals in basalt-andesite-H ₂ O at 30 kbar with implications for subduction zone magmas	Charles R. Stern and Peter J. Wyllie	641
Multisystems analysis of beryllium mineral stabilities: the system BeO-Al ₂ O ₃ -SiO ₂ -H ₂ O	Donald M. Burt	664
The relationship between chemical and textural (optical) zoning in metamorphic garnets, South Morar, Scotland	Julio C. Olimpio and David E. Anderson	677
Calibration of oxygen buffers at elevated <i>P</i> and <i>T</i> using the hydrogen fugacity sensor	J-Ming Chou	690
Parnauite and goudeyite, two new copper arsenate minerals from the Majuba Hill Mine, Pershing County, Nevada	William S. Wise	704
Rynersonite, Ca(Ta,Nb) ₂ O ₆ , a new mineral from San Diego County, California.....	Eugene E. Foord and Mary E. Mrose	709
Sarabauite, a new oxide sulfide mineral from the Sarabau Mine, Sarawak, Malaysia	Izumi Nakai, Hajime Adachi, Satoshi Matsubara, Akira Kato, Kazunosuke Masutomi, Takashi Fujiwara and Kozo Nagashima	715
Weissbergite, TiSbS ₃ , a new mineral from the Carlin gold deposit, Nevada.....	Frank W. Dickson and Arthur S. Radtke	720
The divided structure of crystals I. Lineage and sectoral structure in pyrite and beryl	Ion Petreus	725
Impurity-related centers in a pale green calcite crystal.....	Farkhonda Hassan	732
Thermoluminescence studies of some natural and synthetic opals	Ross L. Meakins, Gregory J. Clark and Bruce L. Dickson	737
Revelation of stepped dislocations in amethyst crystals by hydrothermal etching.....	M. S. Joshi, P. N. Kotru and M. A. Ittyachen	744
Thermal transformation of anomalously biaxial dimetric crystals.....	Eugene E. Foord and Charles G. Cunningham	747
Muscovite and K-feldspar from two-mica adamellite in northwestern Maine: composition and petrogenetic implications	Charles V. Guidotti	750
Rowlandite from the Barringer Hill rare-earth pegmatite district, Llano and Burnet Counties, Texas	Wilson W. Crook, III, Rodney C. Ewing and Arthur J. Ehlmann	754
A uranium- and thorium-rich monazite from a south-alpine pegmatite at Piona, Italy	Carlo Maria Gramaccioli and Tom Victor Segalstad	757
Rancieite associated with a karstic bauxite deposit	G. Bardossy and G. W. Brindley	762
Test of plagioclase dispersion method and rapid probe analysis	S. A. Morse	768
An aenigmatite-richterite-olivine trachyte from Puu Koae, West Maui, Hawaii	Danielle Velde	771
Infrared spectroscopic evaluation of iron contents and excess calcium in minerals of the dolomite-ankerite series	Victor C. Farmer and Slade St. J. Warne	779
Layer deformation and crystal energy of micas and related minerals. I. Structural models for 1M and 2M ₁ polytypes	C. Anton J. Appelo	782
NEW MINERAL NAMES.....		793
BOOK REVIEWS.....		797

September, October 1978

Numbers 9 and 10

Differential thermal analysis of some irradiated materials	Robert M. Berman	807
Crystal structure of hydrochlorborite, $\text{Ca}_2[\text{B}_3\text{O}_3(\text{OH})_4] \cdot \text{OB}(\text{OH})_3\text{Cl} \cdot 7\text{H}_2\text{O}$, a seasonal evaporite mineral	Gordon E. Brown and Joan R. Clark	814
An X-ray powder camera for taking photographs at low temperatures	Martin J. Buerger and Gerald L. Shoemaker	824
Authigenic todorokite and phillipsite inside deep-sea manganese nodules	Virginia Mee Burns and Roger G. Burns	827
On cooperite, braggite, and vysotskite	Louis J. Cabri, J. H. Gilles Laflamme, John M. Stewart, Kent Turner and Brian J. Skinner	832
How much crystallography should we teach geologists?	Gabrielle Donnay and J. D. H. Donnay	840
Carlriesite: crystal structure, revision of chemical formula, and synthesis	Herta Effenberger, Josef Zemann and Helmut Mayer	847
Error problems in the two-media method of deriving the optical constants n and k from measured reflectances	Peter G. Embrey and Alan J. Criddle	853
The crystal chemistry of sherwoodite, a calcium 14-vanadoaluminate heteropoly complex	Howard T. Evans, Jr. and Judith A. Konner	863
Relation of the relative concentrations of lanthanides in titanite to type of host rocks	Michael Fleischer	869
Crystal structures of the humite minerals: V. Magnesian manganhumite	Carl A. Francis and Paul H. Ribbe	874
Compositional variation of muscovite in medium- to high-grade metapelites of northwestern Maine	Charles V. Guidotti	878
Predicted and observed compositional limits of trioctahedral micas	Robert M. Hazen and David R. Wones	885
Goniometry from photographs or angle-true sketches	Max H. Hey	893
Regional metamorphism of Proterozoic iron-formation, Labrador Trough, Canada	Cornelis Klein	898
Compositional and refractive index variations of the herderite-hydroxyl-herderite series	Peter B. Leavens, Pete J. Dunn and Richard V. Gaines	913
Silicates with branched anions: a crystallochemically distinct class	Friedrich Liebau	918
Implications of a titanium-rich glass clod at Oceanus Procellarum	Ursula B. Marvin and David Walker	924
Abelsonite, nickel porphyrin, a new mineral from the Green River Formation, Utah	Charles Milton, Edward J. Dwornik, Patricia A. Estep-Barnes, Robert B. Finkelman, Adolf Pabst and Susan Palmer	930
Kraisslite, a new platy arsenosilicate from Sterling Hill, New Jersey	Paul B. Moore and Jun Ito	938
Petscheckite and liandratite, two new pegmatite minerals from Madagascar	Arno Mücke and Hugo Strunz	941
Zoned plagioclase and peristerite formation in phyllites from southwestern Massachusetts	Gordon L. Nord, Jr., Jane Hammarstrom and E-an Zen	947
The use of infrared spectra for the determination of minerals	A. S. Povarennykh	956
Enumeration of 4-connected 3-dimensional nets and classification of framework silicates, II. Perpendicular and near-perpendicular linkages from 4.8^2 , 3.12^2 and $4.6.12$ nets	Joseph V. Smith	960
Petrogenesis of lithium-rich pegmatites	David B. Stewart	970
Triclinic feldspars: angular relations and the representation of feldspar series	James B. Thompson, Jr. and Guy L. Hovis	981
Monticellite marble at Cascade Mountain, Adirondack Mountains, New York	Robert J. Tracy, Howard W. Jaffe and Peter Robinson	991
New biopyriboles from Chester, Vermont: I. Descriptive mineralogy	David R. Veblen and Charles W. Burnham	1000
Lunar plutonic rocks: a suite of materials depleted in trace siderophile elements	Jeffrey L. Warner and Charles E. Bickel	1010
Khinite, parakhinite, and dugganite, three new tellurates from Tombstone, Arizona	S. A. Williams	1016
BOOK REVIEWS		1020

November, December 1978

Numbers 11 and 12

Nomenclature of amphiboles	Bernard E. Leake	1023
New biopyriboles from Chester, Vermont: II. The crystal chemistry of jimthompsonite, clinojimthompsonite, and chesterite, and the amphibole-mica reaction	David R. Veblen and Charles W. Burnham	1053
Amphiboles in andesite and basalt: II. Stability as a function of P - T - $f\text{H}_2\text{O}$ - $f\text{O}_2$	J. C. Allen and A. L. Boettcher	1074
Highly aluminous hornblendes: compositions and occurrences from southwestern Massachusetts	Barry L. Doolan, E-an Zen and A. E. Bence	1088
Omphacite studies, I. The $P2/n \rightarrow C2/c$ transformation	M. E. Fleet, C. T. Herzberg, G. M. Bancroft and L. P. Aldridge	1100
Omphacite studies, II. Mössbauer spectra of $C2/c$ and $P2/n$ omphacites	L. P. Aldridge, G. M. Bancroft, M. E. Fleet and C. T. Herzberg	1107
Orthoferrosilite and other iron-rich pyroxenes in micropertthite gneiss of the Mount Marcy area, Adirondack Mountains	Howard W. Jaffe, Peter Robinson and Robert J. Tracy	1116
The crystal chemistry and petrogenesis of a magnesian rhodonite	Donald R. Peacor, Eric J. Essene, Philip E. Brown and Gary A. Winter	1137
Phase relations in the binary Hg-S	Robert W. Potter II and H. L. Barnes	1143
Polhemusite, a new Hg-Zn sulfide from Idaho	B. F. Leonard, George A. Desborough and Cynthia W. Mead	1153
Tsumoite, BiTe, a new mineral from the Tsumo mine, Japan	Hidehiko Shimazaki and Tohru Ozawa	1162
Manganochromite, palladium antimonide, and some unusual mineral associations at the Nairne pyrite deposit, South Australia	J. Graham	1166

Surite, a new Pb-rich layer silicate mineral	<i>Kitaro Hayase, Jorge A. Dristas, Sadao Tsutsumi,</i>	1175
.....	<i>Ryohei Otsuka, Sachio Tanabe, Toshio Sudo and Tsutomu Nishiyama</i>	
Schreyerite, $V_2Ti_3O_9$, a new mineral.....	<i>Olaf Medenbach and Karl Schmetzer</i>	1182
Marsturite, $Mn_3CaNaHSi_5O_{16}$, a new mineral of the nambulite group from Franklin, New Jersey	<i>Donald R. Peacor, Pete J. Dunn and B. Darko Sturman</i>	1187
Lattice dynamical study of the α - β quartz phase transition.....	<i>Kazuaki Iishi</i>	1190
Lattice dynamics of forsterite.....	<i>Kazuaki Iishi</i>	1198
Opaque oxide mineral crystallization in lunar high-titanium mare basalts	<i>Richard D. Warner, C. E. Nehru and Klaus Keil</i>	1209
Subsolidus phase relations in the nepheline-kalsilite system at 0.5, 2.0, and 5.0 kbar	<i>John M. Ferry and James G. Blencoe</i>	1225
The crystal structures and the phase transformation of Zn-Li silicates	<i>Shu-cheng Yu, Deane K. Smith and Stanley B. Austerman</i>	1241
A new X-ray method for the estimation of fluorine content in montebrasites	<i>Pekka Kallio</i>	1249
Thermal changes in monoclinic tridymite	<i>Akihiko Nukui, Hiromoto Nakazawa and Masaru Akao</i>	1252
Polytype transformations in experimentally deformed wollastonite	<i>Stephen Guggenheim</i>	1260
Crystal structures and compositions of sanidine and high albite in cryptoperthitic intergrowth	<i>Keith D. Keefer and Gordon E. Brown</i>	1264
A new 5C pyrrhotite	<i>Ruth F. Engel, Donald R. Peacor and William C. Kelly</i>	1274
Superposition model analysis of the near infrared spectrum of Fe^{2+} in pyrope-almandine garnets	<i>Douglas J. Newman, Donald C. Price and W. Alan Runciman</i>	1278
NEW MINERAL NAMES		1282
ERRATA		1284
BOOK REVIEWS		1285
NOTICES		1286
INDEX		1287