

## THE CANADIAN MINERALOGIST

## CONTENTS, VOLUME 24

Izoklakeite, a new mineral species from Izok Lake, Northwest Territories D.C. HARRIS, A.C. ROBERTS & A.J. CRIDDLE	1
Izoklakeite from Vena, Sweden, and the kobellite homologous series M.A. ZAKRZEWSKI & E. MAKOVICKY	7
Giessenite from Giessen near Binn, Switzerland: new data S. GRAESER & D.C. HARRIS	19
New data on giessenite from the Bjørkåsen sulfide deposit at Otofthen, northern Norway E. MAKOVICKY & S. KARUP-MØLLER	21
Subdivision of the pyrite group, and a chemical and X-ray-diffraction investigation of ullmannite P. BAYLISS	27
Rates of reaction of covellite and <i>blaubleibender</i> covellite with ferric iron at pH 2.0 C.A. WALSH & J.D. RIMSTIET	35
The properties and modulated structure of potosiite from the Cassiar District, British Columbia S.A. KISSIN & D.R. OWENS	45
Rapidcreekite, a new hydrated calcium sulfate-carbonate from the Rapid Creek area, Yukon Territory A.C. ROBERTS, H.G. ANSELL, I.R. JONASSON, J.D. GRICE & R.A. RAMIK	51
Mannardite [Ba·H <sub>2</sub> O] (Ti <sub>6</sub> V <sup>3+</sup> ) <sub>2</sub> O <sub>16</sub> , a new mineral species, and new data on redleigeite J.D. SCOTT & G.R. PEATFIELD	55
The crystal structure of mannardite, a new hydrated cryptomelane-group (hollandite) mineral with a doubled short axis J.T. SZYMAŃSKI	67
A new paragenesis and new localities for witherite S.C. CHAMBERLAIN, W.P. DOSSERT & D.I. SIEGEL	79
Essais de microanalyse de phyllosilicates par microscopie électronique à balayage et dispersion d'énergie des rayons X M. DESJARDINS & A. CHAGNON	91
Morphological and chemical data on microparticles in Antarctic snows A. GOLDSCHMIDT	99
Magnetic interaction at low temperature in chlorite and its products of oxidation: a Mössbauer investigation M.G. TOWNSEND, G. LONGWORTH & H. KODAMA	105
Petrogenesis of a Neogene shoshonite suite, Cerro Moromoroni, Puno, southeastern Peru D.J. KONTAK, A.H. CLARK, E. FARRAR, T.H. PEARCE, D.F. STRONG & H. BAADSGAARD	117
Petrogenesis of two contrasting Devonian granitic plutons, Cape Breton Island, Nova Scotia S.M. BARR & C.R. PRIDE	137
Zincian spinel and staurolite as guides to ore in the Appalachians and Scandinavian Caledonides P.G. SPRY & S.D. SCOTT	147
Book reviews	
Optical Mineralogy (by D. Shelley)	E.D. GHENT 165
Geochemical Thermodynamics (by D.K. Nordstrom & J.L. Munoz)	R.J. SPENCER 165
An Atlas of Hyperstereograms of the Four-Dimensional Crystal Classes (by E.J.W. Whittaker)	P. BAYLISS 166
Referees for 1985	167
Program and abstracts for the Symposium on Sediment-Hosted Stratiform Copper Deposits	169
Preface to issue on Applied Mineralogy in Science and Technology	D. ABBOTT 217

Petrographic characterization of the solid products of coal-pitch coprocessing J. POTTER, B.D. KYBETT, W.J. MCDUGALL, E.M.V. NAMBU DIRI, P. RAHIMI & J.T. PRICE	219
Compositions and microstructures of furnace-bottom deposits produced from beneficiated Western Canadian bituminous coals T.T. CHEN, D.H.H. QUON & S.S.B. WANG	229
The mineralogy of a silver-rich area in the Edwards zinc-lead mine, New York C.R. SERVISS, C.M. GROUT & R.D. HAGNI	239
Structural and compositional changes in copper sulfides during leaching and dissolution L.S. WHITESIDE & R.J. GOBLE	247
Precious metals in Martin Frobisher's "black ores" from Frobisher Bay, Northwest Territories D.D. HOGARTH & J. LOOP	259
Usage of refractory material in an early Eastern Ontario lead smelter W.F. CALEY & P.W. KINGSTON	265
Les produits de la réaction alcalis-silice dans le béton: étude de cas de la région de Québec M.-A. BÉRUBÉ & B. FOURNIER	271
Mineralogical changes of various cement formulations during reaction with groundwater in the presence of Ca- and Na-bentonite at 150°C R.B. HEIMANN & R.D. HOOTON	289
Constituents of calcined limestone and their relevance in paper manufacturing T.T. CHEN & S.S.B. WANG	303
Architectural conservation and applied mineralogy R.A. LIVINGSTON	307
Influence of physical properties of rock on rate of penetration of a water-jet drill P.E. GRATAN-BELLEW & M.M. VIJAY	323
<hr/>	
A survey of the Pd-Pt mineralization along the 35-km strike of the J-M Reef, Stillwater Complex, Montana A. VOLBORTH, M. TARKIAN, E.F. STUMPFL & R.M. HOUSLEY	329
Sulfide mineralogy and chemical evolution of the Babbitt Cu-Ni deposit, Duluth Complex, Minnesota E.M. RIPLEY & J.A. ALAWI	347
Ore mineralogy of the Agassiz (MacLellan) gold deposit in the Lynn Lake region, Manitoba B.E.K. AUGSTEN, R.I. THORPE, D.C. HARRIS & M.A.F. FEDIKOW	369
Cameronite, a new copper-silver telluride from the Good Hope mine, Vulcan, Colorado A.C. ROBERTS, D.C. HARRIS, A.J. CRIDDLE & W.W. PINCH	379
Compositional trends in tetrahedrite N.E. JOHNSON, J.R. CRAIG & J.D. RIMSTIDT	385
Tellurian tennantite from the Besshi-type deposits in the Sambagawa metamorphic belt, Japan K. KASE	399
Sakuraiite: chemical composition and extent of (Zn,Fe)In-for-CuSn substitution M. SHIMIZU, A. KATO & T. SHIOZAWA	405
Tin-bearing epidote from skarn in the Land's End aureole, Cornwall, England G. VAN MARCKE DE LUMMEN	411
Hydrogen bonding in gaidonnayite G. DONNAY & G.Y. CHAO	417
Book review Microscopic to Macroscopic; Atomic Environments to Mineral Thermodynamics (by S.W. KIEFFER & A. NAVROTSKY) H.J. GREENWOOD	421
Åkermanite: phase transitions in heat capacity and thermal expansion, and revised thermodynamic data B.S. HEMINGWAY, H.T. EVANS, JR., G.L. NORD, JR., H.T. HASELTON, JR., R.A. ROBIE & J.J. MCGEE	425
Hydronium ion in the alunite - jarosite group J.A. RIPMEESTER, C.I. RATCLIFFE, J.E. DUTRIZAC & J.L. JAMBOR	435
Hochelagaite, a new calcium-niobium oxide mineral from Montreal, Quebec A.P. SABINA, A.C. ROBERTS, M. BONARDI, D.R. OWENS & B.D. STURMAN	449

Montroyalite, a new hydrated Sr-Al hydroxycarbonate from the Francon quarry, Montreal, Quebec A.C. ROBERTS, A.P. SABINA, M. BONARDI, J.L. JAMBOR, R.A. RAMIK, B.D. STURMAN & M.J. CARR	455
Signification génétique de la lithiophorite (Al,Li)MnO <sub>2</sub> (OH) <sub>2</sub> dans le gisement manganésifère de Serra do Navio, Brésil E.-A. PERSEIL	461
A comparative study of some pegmatitic and fissure monazite from the Alps G. MANNUCCI, V. DIELLA, C.M. GRAMMACCIOLI & T. PILATI	469
Nickeloan manganoan subcalcic actinolite in a metachert from the Mineoka belt, central Japan S. ARAI & H. HIRAI	475
Structural modulations in iron-rich and magnesium-rich minnesotaite S. GUGGENHEIM & R.A. EGGLETON	479
The electron-microprobe analysis of palygorskite D.G.W. SMITH & D. NOREM	499
The crystal structure of paderaitite, a mineral of the cuprobismutite series W.G. MUMME	513
Man-made Pt-PtAs <sub>2</sub> spherules after sperrylite from alluvial deposits in Finnish Lapland Y. VUORELAINEIN & R. TÖRNROOS	523
Compositional variation of Co-rich pentlandite: relation to the evolution of the upper zone of the western Bushveld Complex, South Africa R.K.W. MERKLE & G. VON GRUENEWALDT	529
The migmatization of Hadrynian sedimentary rocks, Mica Creek, British Columbia R.P. RAESIDE & E.D. GHENT	547
The Harvey volcanic suite, New Brunswick. I. Inclusions of magma in quartz phenocrysts C. PAYETTE & R.F. MARTIN	557
The Harvey volcanic suite, New Brunswick. II. Postmagmatic adjustments in the mineralogy and bulk composition of a high-fluorine rhyolite C. PAYETTE & R.F. MARTIN	571
Sample contamination by grinding C.J. HICKSON & S.J. JURAS	585
Bárcenite discredited P.J. DUNN	591
Book reviews	
Structural Chemistry of Silicates (F. Liebau) Alkaline Ring Complexes in Africa (R. Black & P. Bowden, eds.) Microscopic Determination of the Nonopaque Minerals (M. Fleischer, R.E. Wilcox & J.J. Matzko) J.D.H. DONNAY	593 593 594
Preface to the Ferguson issue F. C. HAWTHORNE	597
Bobfergusonite: a new primary phosphate mineral from Cross Lake, Manitoba T.S. ERCIT, A.J. ANDERSON, P. ČERNÝ & F.C. HAWTHORNE	599
The crystal structure of bobfergusonite T.S. ERCIT, F.C. HAWTHORNE & P. ČERNÝ	605
Lattice-misfit theory and transformation twinning in alkali feldspar M.E. FLEET	615
Structural hierarchy in <sup>VI</sup> M <sub>x</sub> <sup>III</sup> T <sub>y</sub> φ <sub>z</sub> minerals F.C. HAWTHORNE	625
Enumeration of 4-connected 3-dimensional nets and the classification of framework silicates: body-centred cubic nets based on the rhombicuboctahedron F.C. HAWTHORNE & J.V. SMITH	643
Re-evaluation of ordering and local charge-balance in 1a chlorite S.W. BAILEY	649
Parabariomicrolite, a new species, and its structural relationship to the pyrochlore group T.S. ERCIT, F.C. HAWTHORNE & P. ČERNÝ	655
Moydite (Y, REE)[B(OH) <sub>4</sub> ](CO <sub>3</sub> ), a new mineral species from the Evans-Lou pegmatite, Quebec J.D. GRICE, J. VAN VELTHUIZEN, P.J. DUNN, D.E. NEWBURY, E.S. ETZ & C.H. NIELSEN	665
The crystal structure of moydite J.D. GRICE & T.S. ERCIT	675
The crystallography of sakuraiite S.A. KISSIN & D.R. OWENS	679

Morphology of pyrite from the Nanisivik mine, Baffin Island, Northwest Territories	R.I. GAIT & D. DUMKA	685
Mineralogy of hilgardite-4M from evaporites in New Brunswick	A.L. RACHLIN, J.A. MANDARINO, B.L. MUROWCHICK, R.A. RAMIK, P.J. DUNN & M.E. BACK	689
MinIdent: a data base for minerals and a computer program for their identification	D.G.W. SMITH & D.P. LEIBOVITZ	695
Proterozoic sanidine and microcline in pegmatite, Wausau complex, Wisconsin	R.F. MARTIN & A.U. FALSTER	709
Adularia from hydrothermal vein deposits: extremes in structural state	P. ČERNÝ & R. CHAPMAN	717
Implications of the presence of amazonite in the Broken Hill and Geco metamorphosed sulfide deposits	R.K. STEVENSON & R.F. MARTIN	729
Feldspar mineralogy of the Sudbury Igneous Complex and the Onaping Formation, Sudbury, Ontario	E.S. SCHANDL, R.F. MARTIN & J.S. STEVENSON	747
Géochimie de la biotite associée à certains gisements d'or de Val d'Or, Malartic et Chibougamau, Québec	M.F. TANER, P. TRUDEL & G. PERRAULT	761
Lizardite and its parent enstatite: a study by X-ray diffraction and transmission electron microscopy	F.J. WICKS	775
The electron-microprobe analysis of palygorskite: addendum	D.G.W. SMITH & D. NOREM	791
Book reviews		
Natural Zeolites (G. Gottardi & E. Galli)	J. DUDLEY	793
Ring Complex Granites and Anorogenic Magmatism (B. Bonin)	K.L. CURRIE	793
International Tables for Crystallography, Brief Teaching Edition of Volume A, Space-Group Symmetry (T. Hahn, ed.)	J.D.H. DONNAY	794
Proceedings of the thirty-first annual meeting of the Mineralogical Association of Canada	S.M. BARR	799
The Hawley medal for 1986 to Judith B. Moody, Joe E. Jenkins and Dann Meyer		800
The Past Presidents' medal for 1986 to Donald F. Sangster		804
Index, volume 24	J.D. SCOTT	807