COMPREHENSIVE SUBJECT, AUTHOR, TITLE INDEX
VOLUME 35, 1987

V. A. COLTEN-BRADLEY AND F. A. MUMPTON

A
Acid
oxalic, effect of, on dissolution of goethite 347
sites on hydroxy-Al pillared beidellite 251

Adsorption (see also Sorption)
alcohols on Al-, Cr-, Fe³⁺-exchanged montmorillonite, kinetics 336
alcohols on Al-, Cr-, Fe³⁺-exchanged montmorillonite, diffusion coefficients, basal spacings 336
amino acids on montmorillonite-Cu-I-lysine complex 391
cyclic ethers on montmorillonite, kinetics, diffusion coefficients 343
EGME on montmorillonite, ATR, surface area, molecular configuration, diffuse-reflectance IR-Fourier transform spectroscopy 60
1,4-dioxan on Al-, Cr-exchanged montmorillonite 343
quinoline on montmorillonite 121
tetrahydrofluran on Al-, Cr-exchanged montmorillonite 343
tetrahydropan on Al-, Cr-exchanged montmorillonite 343
thiophenes on Cu²⁺-, Fe³⁺-montmorillonite, Raman spectroscopy, IR 53
thiophenes on Cu²⁺-, Fe³⁺-montmorillonite, polymerization in interlayer 53

AEM (see Analytical electron microscopy)
Aggregation (see Flocculation)
AINSWORTH, C. C. (with J. M. ZACHARA and R. L. SCHMIDT), Quinoline Sorption on Na-Montmorillonite: Contributions of the Protonated and Neutral Species 121

Alcohol
adsorption on montmorillonite, kinetics, diffusion coefficients 336
basal spacings of Al-, Cr-, Fe³⁺-montmorillonite in presence of 336
vapor-phase adsorption on montmorillonite, kinetics 336
Alkylammonium
-beidellite, basal spacings 232, 440
-hectorite, basal spacings 440
-montmorillonite, basal spacings 232, 440
-nontronite, basal spacings 232, 440
-saponite, basal spacings 440
-vermiculite, basal spacings 440

Allophane
chemical analysis, TEM, morphology 29
ALPEROVITCH, N. (with I. SHAINBERG and R. KEREN), Charge Density and Na-K-Ca Exchange on Smectites 68
ALPEROVITCH, N. (with I. SHAINBERG, R. KEREN, and D. GOLDSTEIN), Effect of Exchangeable Potassium on the Hydraulic Conductivity of Smectite-Sand Mixtures 305

Alteration (see also Hydrothermal, Diagenesis)
hydrothermal, smectite-to-illite conversion 111
of tufts, zeolites formation by 89
silicic ash, diagenesis in saline lake, zeolite formation 449

Alteration of Phlogopite to Corrensite at Sharbot Lake, Ontario, by C. R. DE KIMPE, N. MILES, H. KODAMA, and J. DEJOU 150

Aluminum
hydroxide, noncrystalline, reaction with phosphates, effect of RH 228
hydroxy-Al-pillared montmorillonite, NMR, XRD, CEC, basal spacings, surface area, IR 251
hydroxy-Al pillaring in beidellite 251
-montmorillonite, alcohol adsorption rates, basal spacings 336
-montmorillonite, cyclic ether adsorption rates, basal spacings 343
oxide, effect of flocculation of kaolinite, montmorillonite 220
oxyhydroxides, synthesis 220, 228
-polyhydroxypolymers, pillaring of, with smectites 81
-substituted tobermorite, CEC, basal spacings, morphology 385
substitution in goethite, effect of photochemical dissolution kinetics 347
substitution in goethite, effect on unit-cell volume 297

Alunite
structural formula 196
traces in hydrothermal Sasso kaolin deposit 321
unit-cell dimensions 196
Amino acid
-Cu-l-lysine complex, structure 391
optical isomers, resolution by adsorption on
montmorillonite-Cu-l-lysine complex using
HPLC 391

Ammonium
-Na exchange for clinoptilolite determination in
soils 463
-Na exchange on clinoptilolite, selectivity coeffi-
cient 463
-tert-butyl exchange, for quantitative determina-
tion of clinoptilolite in soils 463

Analcime
chemical composition, electron microprobe
analysis 89
in altered tufts 89
-rich tuff, alteration of, petrography 449

Analytical electron microscope (AEM)
goethite in weathered olivine 418
halloysite in weathered olivine 418
iddingsite 418
illite/smectite, hydrothermal 111
olivine, weathered 418
smectite in weathered olivine 418

Anilinium
intercalate with vermiculite, crystal structure,
electron microprobe analysis, unit-cell
parameters 177
intercalation with vermiculite 177

Anions
carbonate-sulfate, in interlayer of hydrotalcite-
manasseite group 401
effect on synthesis of magadiite, kenyaite 318
oxalate, effect on dissolution kinetics of goethite
347

Announcement
Euroclay '87 meeting 239
Proceedings of the International Clay Conference,
Denver, 1985, publication of 160
24th annual meeting, The Clay Minerals Society
240

Apatite
fluor-, mineralogy in Excello black shale 262

Asbestos
chrysotile formation in debris flow by replacement
of lizardite 43

Atomic coordinates
clinochlore, ferroan 129
hydrogen in kaolinite 237
nontronite 363

ATR (see Attenuated total reflectance spectroscopy)
Attapulgite (see Palygorskite)
Attenuated total reflectance spectroscopy (ATR) (see
also Infrared spectroscopy) EGME-montmoril-
onite complex 60

Authigenesis
chlorite, replacement of kaolinite 291

chrysotile, replacement of lizardite in debris flows
43
illite/smectite, source of iron for chlorite 291
kaolinite formation, Gulf Coast sediments 291
pseudoboehmite, with chrysotile in debris flow 43

Authigenesis of Kaolinite and Chlorite in Texas Gulf
Coast Sediments, by J. H. Burton, D. H. Krinsley,
and K. Pye 291

Authigenic Chrysotile Formation in the Matrix of Qua-
ternary Debris Flows, Northern Southland, New
Zealand, by D. Craw, C. A. Landis, and P. I.
Kelsey 43

B
Back-scattered electron imaging (see Scanning electron
microscopy)

BAILEY, S. W. (with A. C. RULE), Refinement of the
Crystal Structure of a Monoclinic Ferroan Clino-
chlore 129

BARRON, P. F. (with J. G. THOMPSON), Further Con-
sideration of the 29Si Nuclear Magnetic Resonance
Spectrum of Kaolinite 38

BARRON, P. F. (with M. RAUPACH and J. G. THOMPSON),
Nuclear Magnetic Resonance, Infrared, and X-ray
Powder Diffraction Study of Dimethylsulfoxide
and Dimethylselenoxide Intercalates with
Kaolinite 208

Basal spacings
beidellite, exchanged with alkylammonium 232
beidellite, K-, Li-, Mg-saturated 232
beidellite, hydroxy-Al pillared 81, 251
CO3-hydrotalcite 401
CO3-manasseite 401
CO3-SO4-hydrotalcite 401
corrensite 150
fluorhectorite, hydroxy-SiAl pillared 429
hectorite, alkylammonium exchanged 440
montmorillonite 81, 232, 251, 336, 343, 440, 429
montmorillonite, Al-, exposed to cyclic ether
vapors 343
montmorillonite, Al-, exposed to water, alcohol
vapors 336
montmorillonite, alkylammonium exchanged
232, 440
montmorillonite-Cu-l-lysine complex 391
montmorillonite, Cr-, exposed to cyclic ether
vapors 343
montmorillonite, Cr-, exposed to water, alcohol
vapors 336
montmorillonite, exchanged with alkyl-, hexyl-
dodecylammonium 232
montmorillonite, Fe-, exposed to water, alcohol
vapors 336
montmorillonite, hydroxy-Al pillared 81
montmorillonite, hydroxy-SiAl pillared 429
montmorillonite, Li-, K-, Mg-saturated 232
montmorillonite, Na-, in water 336
nontronite, alkylammonium exchanged 232, 440
nontronite, Li-, Mg, K-saturated 232
saponite, alkylammonium exchanged 440
saponite, effect of interlayer cation, RH 353
smectite 429, 440
smectite, cross-linked, effect of heat on 429
SO₄-hydrotalcite 401
SO₄-manasseeite 401
toboromite, synthetic 385
vermiculite 353, 440
vermiculite, alkylammonium exchanged 440
vermiculite, effect of interlayer cation, RH, layer charge 353

Basalt
chemical composition, electron microprobe analysis 161
core-stone, composition of smectite in 161
hydrothermal alteration to illite/smectite, illite/chlorite 241
hydrothermal alteration to wairakite 241
immiscible glass, TEM 241
mineralogy 161
natroalunite in laterite profile over 196
olivine in, replacement by goethite, saponite, halloysite, iddingsite 418
weathered, laterite profile on 196
weathered, smectite, halloysite, goethite in 161
weathering of 161, 196, 418

Beidellite (see also Smectite, Montmorillonite)
Al, Fe overgrowths on illite, smectite 189
alkylammonium exchange 232
Cr-, chemical composition 139
differentiation from montmorillonite, problems 232
H⁺-, NMR 251
hydroxy-Al pillared, XRD, CEC, basal spacings, IR, surface area, porosity, acid sites 81, 251
identification, problems of, Greene-Kelly test, 232
iron-rich, in vertisol, structural formula, sediment volume, optical density, UV adsorption 311
layer charge 232
Li-saturated, exchanged with alkyl-, hexyl-, dodecylammonium ions, basal spacings 232
pillared with Al-polyhydroxypolymer 81
synthesis 81, 251

Ben-DOR, EYAL (with ARIEH SINGER), Optical Density of Vertisol Clay Suspensions in Relation to Sediment Volumes and Dithionite-Citrate-Bicarbonate-Extractable Iron 311

Bentonite (see also Montmorillonite, Smectite)
analcime, clinoptilolite replacement of 449
hydrothermal alteration to wairakite 241
smectite in, SEM, EXD, TEM, XRD 241
stability under hydrothermal conditions 241

Benzidinium
-vermiculite intercalate, Mössbauer spectroscopy 203
Berthierine
/illite, EDX, TEM 241
/illite, formation by hydrothermal alteration of illite 241

BIBBY, D. M. (with R. A. FLETCHER), Synthesis of Kenyaite and Magadiite in the Presence of Various Anions 318

BIGHAM, J. M. (with W. F. JAYNES), Charge Reduction, Octahedral Charge, and Lithium Retention in Heated, Li-Saturated Smectites 440

Birnessite
hydrothermal transformation to buserite, manganite, todorokite 271
saturated with various cations, XRD, TEM, IR, electron diffraction pattern 271
(7-Å manganite), space group, unit-cell parameters, structural formula 271
synthetic, SEM, TEM, chemical analysis 271
transformation to buserite, cryptomelane, hollandite, todorokite 271
unit-cell dimensions, 7-Å manganite, synthetic 271

BISH, D. L. (with D. E. BROXTON and R. G. WARREN), Distribution and Chemistry of Diagenetic Minerals at Yucca Mountain, Nye County, Nevada 89

Black shale
Excello, petrology, mineralogy, stratigraphy, XRD 262
limestone concretions in, formation of 262
organic carbon content 262
phosphate nodules in, diagenetic formation of 262

Boehmite
pseudo-, authigenic, in debris flows with chrysotile 43
pseudo-, authigenic, IR, DTA, electron microprobe analysis 43

Bond lengths (see also Interatomic distances)
in kaolinite: DMSeO intercalate 208
in kaolinite: DMSO intercalate 208
interlayer atoms and surface oxygens in the vermiculite-anilinium intercalate 179
Si...H distances in kaolinite 38
Si-O in kaolinite 38

Book review
Clay in Engineering Geology, 2nd ed., by J. E. Gillott 477
Clay Microstructure, by R. H. Bennett and M. H. Hulbert 400
The Chemistry of Weathering, edited by J. I. Drever 80
Thermodynamic Values at Low Temperature for Natural Inorganic Materials, by T. L. Woods and R. M. Garrels 159
BREEN, C. (with A. T. DEANE and J. J. FLYNN), Vapor-Phase Sorption Kinetics for Tetrahydrofuran, Tetrahydropan, and 1,4-Dioxan by Al\(^{3+}\) and Cr\(^{3+}\)-Exchanged Montmorillonite 343

BREEN, C. (with A. T. DEANE, J. J. FLYNN, and D. REYNOLDS), Vapor-Phase Sorption Kinetics for Methanol, Propan-2-ol, and 2-Methylpropan-2-ol on Al\(^{3+}\), Cr\(^{3+}\), and Fe\(^{3+}\)-Exchanged Montmorillonite 336

BREVAL, ELSE (with SRIDHAR KOMARNENI, MICHIIRO MIYAKE, and RUSTUM ROY), Cation-Exchange Properties of (Al + Na)-Substituted Synthetic Tobermorites 385

BRONTON, D. E. (with D. L. BISH and R. G. WARREN), Distribution and Chemistry of Diagenetic Minerals at Yucca Mountain, Nye County, Nevada 89

BURTON, J. H. (with D. H. KRINSLEY and K. PYE), Authigenesis of Kaolinite and Chlorite in Texas Gulf Coast Sediments 291

Buserite

transformation of birnessite to 271

Calcium

-Na\(^+\) exchange on clinoptilolite, selectivity coefficient 458

Carbonate

anion, effect of, on synthesis of kenyaita, magadiite 318
-hydrotalcite, XRD, structural formula, unit-cell parameters, density, nomenclature 401
-manasseite, XRD, unit-cell parameters, chemical composition, structure 401
-SO\(_4\)-hydrotalcite, XRD, structural formula, unit-cell parameters, structure, nomenclature 401

systems, magadiite, kenyaita synthesis in 318

CARDILE, C. M. (with J. H. JOHNSTON), Iron Substitution in Montmorillonite, Illite, and Glauconite by \(^{57}\)Fe Mössbauer Spectroscopy 170

CARDILE, C. M. (with P. G. SLADE), Structural Study of a Benzidine-Vermiculite Intercalate having a High Tetrahedral-Iron Content by \(^{57}\)Fe Mössbauer Spectroscopy 203

CARLSON, L. (with U. SCHWERTMANN and E. MURAD), Properties of Iron Oxides in Two Finnish Lakes in Relation to the Environment of their Formation 297

Cation exchange

Ca-Na, Na-NH\(_4\), on clinoptilolite, selectivity coefficient 458

K-Ca on smectite, effect of layer charge density, selectivity coefficients 68

K-Na on smectite, effect of layer charge density, selectivity coefficients 68

Na, on smectite, Gapon's constant 305

Na-Ca on smectite, effect of layer charge density, selectivity coefficients 68

Na-Cs on Al-, Na-substituted tobermorite 379

quinoline-Na exchange on montmorillonite 121

selectivity coefficient, Gapon's constant, Na, K on smectites 305

Cation-exchange capacity (CEC)

clinoptilolite 469

clinoptilolite, quantitative mineralogy of, in soils 463

hydroxy-Al beidellite 251

reduction of, Li-retention in smectites, Hofmann-Klemen effect, octahedral layer charge 440

smectites 68, 305

tobermorite, synthetic Al-, Na-substituted tobermorite 385

vertisols 311

Cation Properties of (Al + Na)-Substituted Synthetic Tobermorites, by Sridhar Komarneni, Else Breval, Michihiro Miyake, and Rustum Roy 385

CEC (see Cation-exchange capacity)

Celadonite

IR spectroscopy 363

iron octahedral distribution 363

Mössbauer spectroscopy, computer simulation of, electric field gradient calculations 363

structural formula 363

Cesium

-Na exchange on tobermorite, selectivity coefficient 385

Characterization of Overgrowth Structures Formed around Individual Clay Particles during Early Diagenesis, by Michel Steinberg, Thierry Holtzapffel, and Michel Rautureau 189

Charge balance

tetrahedral substitution in ferroan clinochlore, order-disorder 129

Charge density

effects on Na-K-Ca exchange on smectites, swelling 68

smectites, effect on exchangeable K, hydraulic conductivity 305

Charge Density and Na-K-Ca Exchange on Smectites, by I. Shainberg, N. I. Alperovitch, and R. Keren 68

Charge Reduction, Octahedral Charge, and Lithium Retention in Heated, Li-Saturated Smectites, by W. F. Jaynes and J. M. Bigham 440

Chemical analysis (see also Chemical composition)

allophane 29

basalt core-stones 161

birnessite, percent Mn, Mn oxidation state 271

chrysotile, electron microprobe, Al-Fe-Mg composition 43

cordierite, weathered 29

corrensite, from hydrothermally altered phlogopite 150

ferrrihydrite 29

hisingerite 29
lateritic pisolite 29
limburgite glass 29
lizardite, electron microprobe analysis, Al-Fe-Mg composition 43
noncrystalline Fe-Si-Al oxyhydroxide gels 29
phlogopite, electron microprobe analysis 150
pseudoboehmite, electron microprobe analysis 43
todorokite, percent Mn, Mn oxidation state 271

Chemical and Morphological Evidence for the Conversion of Smectite to Illite, by Atsuyuki Inoue, Norihiko Kohyama, Ryuji Kitawaga, and Takashi Watanabe 111

Chemical composition
analcime in altered tuff, electron microprobe analysis 89
basalt, weathered 161
beidellite, chromian 139
chrysotile, lizardite in debris flow, Al, Fe, Mg 43
clinochochlore, ferroan, electron microprobe analysis 129
clinoptilolite in altered tuff, electron microprobe analysis 89
CO3-hydrotalcite 401
CO3-mannasite 401
feldspar in altered tuff, electron microprobe analysis 89
hydroxy-SiAl cross-linked montmorillonite 429
illite, Muloorine, Australia 170
illite/smectite from hydrothermally altered volcanic glass, electron microprobe analysis 111
iron oxide lake sediments 297
kaolinite, Georgia 38
kaolinite, St. Austell 38
kenyaite 318
limburgite 29
magadite 318
manasite 401
montmorillonite, chromian 139
montmorillonite, Drayton, Australia 170
natroalunite 196
nontronite, chromian 139
olivine, weathered, Al-Mg-Fe by electron microprobe, EXD, AEM 418
overgrowth on illite and smectite 189
pisolite, laterite 29
smectite, iron-rich beidellite in vertisols, structural formula 311
smectitic clay, from weathered pyroxenite, electron microprobe analysis 1
SO4-hydrotalcite 401
tuff, bulk-rock 89
vertisol clay 311
volkonskoite 139

Chenh, C. C. (with D. C. golden and J. B. Dixon), Transformation of Birnessite to Buserite, Todorokite, and Manganite under Mild Hydrothermal Treatment 271

Cherkashin, V. I. (with V. A. Drits, T. N. Sokolova, and G. V. Sokolova), New Members of the Hydrotalcite-Manasseite Group 401

Chitale, D. V. (with Necip Guven), Natroalunite in a Laterite Profile over Deccan Trap Basalts at Matanumad, Kutch, India 196

Chlorite
berthierine, distribution in Excello black shale 262
berthierine, hydrothermal alteration of illite, TEM, EDX 262
clinochochlore, ferroan, crystal structure, atomic positions, interatomic distances, interlayer octahedra, chemical composition, space group 129
corrensite, XRD, DTA, DTG, electron microprobe analysis, IR, structural formula 150
Cr-bearing, as distinguished from volkonskoite 139
illite, hydrothermal alteration of basalt and bentonite, TEM, EDX, XRD 241
iron-rich, authigenic, Gulf Coast sediments, TEM, EDX, SAD, back-scattered electron image 291
morphology, TEM 291
pseudomorphous after kaolinite, SEM 291
smectite, alteration of phlogopite to 150 structure, IIb2 polytype 129

Chromium
chlorite, montmorillonite, volkonskoite nomenclature problem 139
-exchanged montmorillonite, 1,4-dioxane, tetrahydrofuran, tetrahydropyran adsorption on 343
-exchanged montmorillonite, vapor-phase adsorption of alcohols on 336
-montmorillonite, alcohol, cyclic ether adsorption rates 336
-montmorillonite, basal spacings 336
-smectite, volkonskoite, chemical composition, TGA, XRD, Mössbauer spectroscopy, nomenclature 139

Chrysotile
asbestos fiber formation in debris flows 43
authigenic, chemical analysis 43
authigenic, petrography, XRD, electron microprobe analysis, DT, IR, TEM 43
authigenic, replacement of lizardite, petrography 43

Clay Minerals Society, The
annual meeting, 24th, announcement 240

Clinchochlore
ferroan, crystal structure, atomic coordinates, chemical composition, space group 129

Clinoptilolite
CEC 463, 469
Chemical composition 89
Electron microprobe analysis 89, 281
Formation by replacement of volcanic glass 281
In fossilized root, in altered tuff interbedded with lignite 281
Na-NH₄ exchange, Na-tertbutylammonium exchange 463
Na-Ca, Na-NH₄ exchange, selectivity coefficient 458
Quantitative determination in soils 463
Rich altered tuff, petrography 89, 449
SEM 281, 458
SEM, EDX, XRD, petrography, morphology 281
Separation from soils, specific gravity 469
Structural formula 469
XRD 281, 469


Collophane
diagenetic, Excello black shale 262
Composition and structural variations in the size fractions of a sedimentary and a hydrothermal kaolin, by Gianni Lombardi, J. D. Russell, and W. D. Keller 321

Computer simulation
Mössbauer spectra, nontronite, celadonite, Fe-octahedron orientation, electric field gradient calculations 363

Concretions
limestone, formation, Excello black shale 262
Conditional equilibrium constant (see Vaneslow selectivity)

Copper
Cu-l-lysine-montmorillonite complex, amino acid adsorption on 391
-montmorillonite, polymerization of thiophene in interlayer region, Raman spectroscopy, IR 53

Cordierite
alteration to halloysite, TEM 29
weathered, noncrystalline Fe-Si-Al oxyhydroxides, chemical analysis 29

Core-stone
basalt, chemical composition of smectite in 161

Cornell, R. M. (with R. Giovonoli), Effect of manganese on the transformation of ferrihydrite into goethite and jacobsite in alkaline media 11

Cornell, R. M. (with R. Giovonoli and P. W. Schindler), Effect of silicate species on the transformation of ferrihydrite into goethite and hematite in alkaline media 21

Cornell, R. M. (with P. W. Schindler), Photochemical Dissolution of Goethite in Acid/Oxalate Solution 347

Corrensite
Hydrothermal alteration of phlogopite 150
Smectite/chlorite, XRD, TGA, IR, DTA, SEM, electron microprobe analysis, structural formula 150

Cosca, M. A. (with Y.-C. Yau, D. R. Peacor, E. J. Essene, J. H. Lee, and L.-C. Kuo), Hydrothermal Treatment of Smectite, Illite, and Basalt to 460°C: Comparison of Natural with Hydrothermally Formed Clay Minera 241

Craw, D. (with C. A. Landis and P. I. Kelsey), Authigenic Chrysotile Formation in the Matrix of Quaternary Debris Flows, Northern Southland, New Zealand 43

Critical coagulation concentration (CCC)
determination by percent transmittance 220
Flocculation value 220
For kaolinite 220
For montmorillonite 220
Cross-linked smectite (CLS) (see also Pillared interlayer complex)
fluorhectorite, basal spacings, surface area, structure, thermal stability 429
montmorillonite, basal spacings, surface area, chemical composition, structural formula, thermal stability 429
synthesis, hydroxy-SiAl exchange 429

Cross-linked Smectites, V. Synthesis and Properties of Hydroxy-Silicoaluminum Montmorillonites and Fluorhectorites, by Johan Sterte and Joseph Shabtai 429

Cryptomelane
space group, structural formula, unit-cell parameters 271

Crystal growth
overgrowth structures on illite, smectite during early diagenesis 189

Crystal Structure of a Vermiculite-Anilinium Intercalate, by P. G. Slade, C. Dean, P. K. Schultz, and P. G. Self 177

Crystal structure
anilinium-intercalated vermiculite 177
chlorite, IIb-2 polytype 129
clinochlore, ferroan, interlayer octahedra 129
CO₃-hydrrotalcite 401
CO₃-manasseite 401
CO₃-SO₄-hydrrotalcite 401
cross-linked fluorhectorite, hydroxy-SiAl oligocation 429
Cu-l-lysine-amino acid complex 391
DMSeO:kaolinite intercalate 208
hydroxy-Al polymers 251
hydroxy-SiAl oligocation 429
kaolinite, crystal, electron diffraction, XRD 237
palygorskite, micropore sites 473
Position of ions in phyllosilicates by EXAFS 1
SO₄-hydrotalcite 401
vermiculite-anilinium intercalate 177

Crystallinity
  goethite, effect of silica on 21
  kaolinite, XRD 321
Cu-l-lysine
  -amino acid complex, structure 391
  -montmorillonite complex, use in HPLC to separate optical isomers of amino acids, basal spacings 391
Curie constants, nontronite, unaltered and reduced 373
  -Weiss temperatures, nontronites, unaltered and reduced 373

Cyclic ethers
  adsorption on Al³⁺- and Cr³⁺-montmorillonite, kinetics, diffusion coefficients 343
  1,4-dioxan, adsorption on Al³⁺- and Cr³⁺-montmorillonite 343
  tetrahydrofuran, adsorption on Al³⁺- and Cr³⁺-montmorillonite 343
  tetrahydropyan, adsorption on Al³⁺- and Cr³⁺-montmorillonite 343

DAYNYAK, L. G. (with V. A. DRITS), Interpretation of Mössbauer Spectra of Nontronite, Celadonite, and Glauconite 363

DE KIMPE, C. R. (with N. MILES, H. KODAMA, and J. DEJOU), Alteration of Phlogopite to Corrensite at Sharbot Lake, Ontario 150

DEAN, C. (with P. G. SLADE, P. K. SCHULTZ, and P. G. SELF), Crystal Structure of a Vermiculite-Anilinium Intercalate 177

DEANE, A. T. (with C. BRENN and J. J. FLYNN), Vapor-Phase Sorption Kinetics for Tetrahydrofuran, Tetrahydropyan, and 1,4-Dioxan by Al³⁺- and Cr³⁺-Exchanged Montmorillonite 343

DEANE, A. T. (with C. BRENN, J. J. FLYNN, and D. REYNOLDS), Vapor-Phase Sorption Kinetics for Methanol, Propan-2-ol, and 2-Methylpropan-2-ol on Al³⁺-, Cr³⁺-, and Fe³⁺-Exchanged Montmorillonite 336

Debris flow
  ophiolite melange, New Zealand, authigenic chrysotile, pseudoboehmite formation in 318


DEJOU, J. (with C. R. DE KIMPE, N. MILES, and H. KODAMA), Alteration of Phlogopite to Corrensite at Sharbot Lake, Ontario 150

Density
  CO₃-hydrotalcite 401
  CO₃-manaseite 401
  CO₃-SO₄-hydrotalcite 401
  as a measure of weathering intensity 161
  heavy liquid separation of clinoptilolite from soil 469
  related to element mobility during weathering of basalt 161
  SO₄-hydrotalcite 401

Diagenesis
  beidellite overgrowths on illite, smectite, TEM, chemical analysis 189
  collophane formation in Excello black shale 262
  phosphate replacement of limestone nodules in black shale 262
  silicification of clays 189
  smectite-to-illite conversion, dissolution-reprecipitation mechanism, morphological evidence 111
  tuff, in open hydrologic system, Yucca Mountain, Nevada 89
  zeolite formation in tuff 89, 449

Diagenetic Alteration of Silica Ash in Searles Lake, California, by R. L. Hay and S. G. Guldman 449

Dickite
  in hydrothermal kaolin 321

Differential thermal analysis (DTA)
  chrysotile 43
  corrensite 150
  dehydroxylation of goethite 297
  kaolin, hydrothermal, different particle sizes 321
  kaolin, sedimentary, different particle sizes 321
  pseudoboehmite 43

Differential thermogravimetric analysis (DTGA) (see Thermal gravimetric analysis)

Differential X-ray powder diffraction (DXRD)
  ferrrihydrite 297
  goethite 297
  iron oxide identification 297

Diffuse-reflectance infrared Fourier transform spectroscopy (see Infrared spectroscopy)

Diffusion
  coefficients for sorption of alcohols on montmorillonite 336
  coefficients for sorption of cyclic ethers on montmorillonite 343

Dimethylselenoxide (DMSeO)
  intercalate with kaolinite, NMR, IR, XRD 208
  intercalate with kaolinite, unit-cell dimensions, bond lengths, orientation of organic molecule 208

Dimethylsulfoxide (DMSO)
  intercalate with kaolinite, NMR, IR, XRD 208
  intercalate with kaolinite, unit-cell dimensions, bond lengths, orientation of organic molecule 208

Dispersion
  flocculation, of kaolinite, montmorillonite, effect of oxides on 220
Effect of Exchangeable Potassium on the Hydraulic Conductivity of Smectite-Sand Mixtures, by I. Shainberg, R. Keren, N. Alperovitch, and D. Goldstein 305

Effect of Manganese on the Transformation of Ferrihydrite into Goethite and Jacobsite in Alkaline Media, by R. M. Cornell and R. Giovanoli 11

Effect of Saturating Cation, pH, and Aluminum and Iron Oxide on the Flocculation of Kaolinite and Montmorillonite, by Sabine Goldberg and R. A. Glaubig 220

Effect of Silicate Species on the Transformation of Ferrihydrite into Goethite and Hematite in Alkaline Media, by R. M. Cornell, R. Giovanoli, and P. W. Schindler 21

EG (see Ethylene glycol)

EGGETON, R. A., Noncrystalline Fe-Si-Al-Oxyhydroxides 29

EGGETON, R. A. (with CHRIS FOUDOULIS and DANE VARI~VISSER), Weathering of Basalt: Changes in Rock Chemistry and Mineralogy 161


EGME (see Ethylene glycol monoethylether)

Electric field gradient

use of, in computer simulation of Mössbauer spectra 363

Electron diffraction (see also Selected-area electron diffraction)

brennessite, saturated with Ca, Ni, Mg, Co, La, Na 271

chlorite, authigenic in Gulf Coast sediments 291

Electron microprobe analysis

analcime, in altered tuff 89

chrysotile, authigenic in debris flow, for Al, Fe, Mg 43

clinochlore, ferroan 129

clinoptilolite 89, 281

clinoptilolite in lignite 281
fieldspar, authigenic, in altered tuff 89

iddingsite, Al, Fe, Mg composition 418

illite/smectite, hydrothermal, in altered volcanic glass 111

lizardite, Al, Fe, Mg composition 43

marcasite, in fossilized plant root, in lignite 281

olivine, Al, Fe, Mg composition 418

opal-CT in lignite, 281

pyrite, in lignite 281

smectite clay from weathered pyroxenite 1

vermiculite: anilinium intercalate 177

vermiculite, Llano 177

volcanic glass 89

Element mobilization

as related to density in weathered basalt 161

Energy-dispersive X-ray analysis (EDX)
bentonite, smectite 241
berthierine 241
chlorite 241, 291
clinoptilolite 281
iddingsite, in weathered olivine 418
illite 241
kaolinite, authigenic 291
marcasite 281
nattoalunita 196
opal-CT 181

ESSENE, E. J. (with Y.-C. YAU, D. R. PEACOR, J. H. LEE, L.-C. KUO, and M. A. COSCA), Hydrothermal Treatment of Smectite, Illite, and Basalt to 460°C: Comparison of Natural with Hydrothermally Formed Clay Minerals 241

Ethylene glycol monoethyl ether (EGME) in micropores of expandable palygorskite 473 in montmorillonite, molecular conformation, orientation in interlayer region, surface area 60 -montmorillonite complex, ATR, IR 60

Expandable layers of palygorskite, EGME positions in micropores 473 percentage in illite/smectite as function of fixed K 111


Extended X-ray absorption fine-structure spectroscopy (EXAFS)
- Ni-talc, from weathered pyroxenite 1
- nontronite, from weathered pyroxenite 1
- smectite, from weathered pyroxenite 1
- structural positions of ions in phyllosilicates by 1

Fiber
- chrysotile, authigenic, formation in debris flows 43
- chrysotile, authigenic, DTA, IR, TEM, XRD, electron microprobe analysis 43
- imogolite, morphology by TEM 379

FLETCHER, R. A. (with D. M. BIBBY), Synthesis of Kenyaite and Magadiite in the Presence of Various Anions 318

Flocculation
critical coagulation concentration 220
dispersion of noncrystalline Al, Fe oxides, kaolinite, montmorillonite, effect of pH 220
kaolinite, effect of cation, pH, Al, Fe oxides 220
montmorillonite, effect of cation, pH, Al, Fe oxides 220
Fluorapatite (see Apatite)
Fluorohectorite (see Hectorite)

FLYNN, J. J. (with C. BRENN and A. T. DEANE), Vapor-Phase Sorption Kinetics for Tetrahydrofluran, Tetrahydropropand, and 1,4-Dioxan by Al³⁺- and Cr³⁺-Exchanged Montmorillonite 343

FLYNN, J. J. (with C. BRENN, A. T. DEANE, and D. REYNOLDS), Vapor-Phase Sorption Kinetics for Methanol, Propan-2-ol, and 2-Methylpropan-2-ol on Al³⁺-, Cr³⁺-, and Fe³⁺-Exchanged Montmorillonite 336

FOORD, E. E. (with H. C. STARKEY, J. E. TAGGERT, JR., and D. R. SHAWE), Reassessment of the Vokonskite-Chromian Smectite Nomenclature Problem 139

FOUDOULIS, CHRIS (with R. A. EGGLETON and DANE VARKEVISSE), Weathering of Basalt: Changes in Rock Chemistry and Mineralogy 161

Fourier analysis
corralsite, one-dimensional 150
difference, vermiculite-anilinium intercalate 177


FRIPiat, J. J. (with D. PLEE and L. GATINEAU), Pillaring Processes of Smectites With and Without Tetrahedral Substitution 81

FRIPiat, J. J. (with A. SCHUTZ, W. E. E. STONE, and G. PONCELot), Preparation and Characterization of Bidimensional Zeolitic Structures Obtained from Synthetic Beidellite and Hydroxy-Aluminum Solutions 251


Fundamental particles
illite/smectite, interpretation of, XRD, TEM 74, 77

Further Consideration of the $^{29}$Si Nuclear Magnetic Resonance Spectrum of Kaolinite, by J. G. Thompson and P. F. Barron 38

FURUKAWA, YUKIO (with YUKO SOMA, MITSUYUKI SOMA, and ISSEI HARADA), Reactions of Thiophene and Methylthiophenes in the Interlayer of Transition-Metal Ion-Exchanged Montmorillonite Studied by Resonance Raman Spectroscopy 53

G
Gaines-Thomas selectivity coefficient
Na-K-Ca exchange on smectite 68
Gapon selectivity coefficient
effect of exchangeable K on hydraulic conductivity of smectite-sand mixtures 305
Na-K-Ca exchange on smectite 68
GATINEAU, L. (with D. PLEE and J. J. FRIPiat), Pillaring Processes of Smectites With and Without Tetrahedral Substitution 81

Gels
Fe-Si-Al oxyhydroxide, noncrystalline, morphology, TEM, chemical analysis 29
Gibbsite
associated with imogolite synthesis 379
morphology, TEM 379

GIOVANOLI, R. (with R. M. CORNELL), Effect of Manganese on the Transformation of Ferrihydrate into Goethite and Jacsobite in Alkaline Media 11
GIOVANOLI, R. (with R. M. CORNELL and P. W. SCHINDLER), Effect of Silicate Species on the Transformation of Ferrihydrate into Goethite and Hematite in Alkaline Media 21

Glass (see also Volcanic ash)
basaltic, hydrothermal alteration to smectite 241
limburgitic, noncrystalline Fe-Si-Al oxyhydr-oxides in, chemical analysis 29

GLAUBIG, R. A. (with SABINE GOLDBERG), Effect of Saturating Cation, pH, and Aluminum and Iron Oxide on the Flocculation of Kaolinite and Montmorillonite 220

Gluconite
Fiji, Francosia, composition 170
iron substitution in 170
Mössbauer spectroscopy 170, 363
Mössbauer spectroscopy, computer simulation of 363
structural formula 363

Goethite
crystallinity, effect of silica on 21
formation from ferrihydrate, effect of silicate species in solution 21
in lake sediments, Al-substitution, iron content, dissolution rate, IR, DTA, Mössbauer spectroscopy 297
in lake sediments, DXRD, unit-cell parameters 297
in weathered basalt 161
in weathered olivine, TEM, AEM, oxidation of iron, SEM, morphology 418
Mn-containing, from Mn-ferrihydrate, XRD, TEM 11
photochemical dissolution, effects of oxalate concentration, pH, Al substitution, surface area 347
synthetic, formed from ferrihydrate, TEM, SEM 21
TEM 11, 21
GOLDEN, D. C. (with C. C. CHEN and J. B. DIXON), Transformation of Birnessite to Buserite,TODO, and Manganite under Mild Hydrothermal Treatment 271
GOLDSTEIN, D. (with I. SHAINBERG, R. KEREN, and N. ALPEROVITCH), Effect of Exchangeable Potassium on the Hydraulic Conductivity of Smeectite-Sand Mixtures 305

Greene-Kelly test
identification of montmorillonite and beidellite, problems 232

GULDMAN, S. G. (with R. L. HAY), Diagenetic Alter-ation of Silica Ash in Searles Lake, California 449

GÜVEN, NECIP (with D. V. CHITALE), Natroalunite in a Laterite Profile over Deccan Trap Basalts at Matanumad, Kutch, India 196

H
Halloysite
in hydrothermal kaolin deposit, morphology, SEM, XRD 321
in weathered basalt 161
in weathered cordierite, TEM 29
in weathered olivine, SEM, TEM, AEM, morphology 418

HARADA, ISSEI (with YUKO SOMA, MITSUYUKI SOMA, and YUKIO FURAKAWA), Reactions of Thiophene and Methylthiophenes in the Interlayer of Transition-Metal Ion-Exchanged Montmorillonite Studied by Resonance Raman Spectroscopy 53

HAY, R. L. (with S. G. GULDMAN), Diagenetic Alteration of Silica Ash in Searles Lake, California 449

Heavy liquid separation
clinoptilolite in soils 469

Hectorite
cross-linked, exchange with hydroxy-SiAl, synthesis, basal spacings, surface area, structure, thermal stability 429
SHCa-1, alkylammonium exchanged, CEC reduction, Li-retention 440
SHCa-1, structural formula, basal spacings, layer charge 440
structural formula 429
synthesis 429
Hematite
eellipsoidal, TEM 21
Mn-containing, synthesis from Mn-ferrihydrite, TEM 11
synthetic, from ferrihydrite, effect of silicate species in solution 21
Herbicide
quinoline adsorption on montmorillonite 121
HERBILLON, A. (with A. DECARREAU, F. COLIN, A.
MANCEAU, D. NAHON, H. PAQUET, D. TRAUTH-BADAUD, and J. J. TRESPACES), Domain Segregation in Ni-Fe-Mg-Smectites 1
Heulandite
in altered tuff 89
Hexylammonium
-exchanged montmorillonite, basal spacing 232
High-pressure liquid chromatography (HPLC)
resolution of amino acid optical isomers using montmorillonite-Cu-I-lysine complex 391
High-resolution transmission electron microscopy (HRTEM)
noncrystalline Fe-Si-Al oxyhydroxides, morphology 29
todorokite, natural, Montenegro Mine, Cuba 271
Hisingerite
chemical analysis, TEM, morphology 29
Hofmann-Klemen effect
reduction of octahedral layer charge, Li retention in smectite 440
Hollandite
space group, structural formula, unit-cell parameters 271
HOLTZAPFFEL, THIERRY (with MICHEL STEINBERG and MICHEL RAUTUREAU), Characterization of Overgrowth Structures Formed around Individual Clay Particles during Early Diagenesis 189
HOSSNER, L. R. (with A. L. SENKAYI, D. W. MING, and J. B. DIXON), Kaolinite, Opal-CT, and Clinoptilolite in Altered Tufts Interbedded with Lignite in the Jackson Group, Texas 281
HPLC (see High-pressure liquid chromatography)
HRTEM (see High-resolution transmission electron microscopy)
HULBERT, M. H., Sodium, Calcium, and Ammonium Exchange on Clinoptilolite from the Fort LaClede Deposit, Sweetwater County, Wyoming 458
Hydraulic conductivity
charge density, effects of 305
Hydrazine
adsorbed on kaolinite, XRD, NMR 38
smectite-sand mixtures, effect of salinity, exchangeable Na, K 305
Hydrogen
bonding in kaolinite, NMR, effects of stacking faults 38
position in kaolinite 237
...Si distances in kaolinite 38
Hydrotalcite
CO3-, XRD, density, unit-cell parameters, structural formula, SEM, nomenclature 401
CO3-SO4-, unit-cell parameters, nomenclature 401
-manasseite group, nomenclature, SEM 401
SO4-, XRD, density, unit-cell parameters, structural formula, SEM, nomenclature, structure 401
Hydrothermal
alteration, birenesite, transformation to buserite, todorokite, manganite 271
alteration, corrensite, formation from phlogopite 150
alteration, illite/berthierine, formation from illite 241
alteration, illite/chlorite, formation from basalt and bentonite, TEM 241
alteration, illite/smectite, formation from basalt 241
alteration, stability of smectite, illite 241
alteration, wairakite, formation from basalt and bentonite 241
Hydrothermal Treatment of Smectite, Illite, and Basalt to 460°C: Comparison of Natural with Hydrothermally Formed Clay Minerals, by Y.-C. Yau, D.
R. Peacor, E. J. Essene, J. H. Lee, L.-C. Kuo, and M. A. Cosca 241
Hydroxides
Al, Fe, noncrystalline 228
Hydroxy-Al
beidellite, pillared with, IR, NMR, basal spacings, surface area, CEC, acid sites 251
pillaring of smectites 81, 251
silico-, oligocations in cross-linked smectites, synthesis, structure, thermal stability 429
structure 251
Hydroxyl
interatomic distances, angles in clinohumite 129
Iddingsite
olivine, weathering of, petrography, chemical composition, SEM, TEM, EDX, AEM 418
Identification
chlorite, kaolinite, use of back-scattered electron images, EDX, crystal morphology 291
iron oxides, use of DXRD 297
montmorillonite and beidellite, problems with the
Greene-Kelly test 232

Illite

beidellite overgrowths on, during early diagenesis,
TEM, EDX, XRD 189
berthierine, hydrothermal alteration of basalt,
bentonite to, TEM, EDX 241
/chlorite, hydrothermal alteration of basalt, ben-
tonite to, TEM, EDX 241
distribution Excello black shale 262
hydrothermal alteration 124
iron substitution in 170
mechanism of formation 111
Mössbauer spectra 170
stability under hydrothermal conditions 241

Illite/smectite

by hydrothermal alteration of basalt 241
errors associated with particle thickness determi-
nation by TEM 74, 77
fundamental particles 74, 77
in hydrothermal kaolin, morphology, SEM, XRD 321
in hydrothermally altered volcanic glass, TEM,
XRD, AEM, chemical composition 111
source of iron for chlorite authigenesis, Gulf Coast
sediments 291
underclays in Pennsylvanian Excello black shale
sequence 262

Imogolite

fibrous morphology, TEM, IR 379
synthesis 379

Imogolite Synthesis at 25°C, by Shin-ichiro Wada 379

Influence of Relative Humidity on the Reaction Prod-
ucts of Phosphates and Noncrystalline Hydroxides
of Aluminum and Iron, by M. Nanzyo 228

Infrared spectroscopy (IR)

beidellite, hydroxy-Al pillared 251
birnessite, saturated with Ca, Mg, Co, Ni 271
celadonite 363
chrysotile, authigenic 43
corrensite 150
diffuse-reflectance, of phosphates 228
EGME 60
EGME-montmorillonite complex, ATR, trans-
mision IR, diffuse-reflectance IR-Fourier
transform spectroscopy 60
goethite, in lake sediments 297
hydroxy-Al pillared beidellite 251
imogolite, synthetic, natural 379
kaolin, hydrothermal, different particle sizes 321
kaolin, sedimentary, different particle sizes 321
kaolinite 203, 321
kaolinite: DMSO intercalate 208
kaolinite: DMSeO intercalate 208
pseudoboehmite 43
smectite, function of dehydroxylation, dehydra-
tion, 1

thiophenes adsorbed on Cu,Fe-montmorill-
one-tite 53
todorokite, natural 271

INOUE, ATSUYUKI (with NORIHiko KOHYAMA, RYUJI
KITAWAGA, and TAKASHI WATANABE), Chemical
and Morphological Evidence for the Conversion
of Smectite to Illite 111

Interatomic distances
clinochlore, ferroan, hydroxyls in 129
interlayer atoms, surface oxygen in kaolinite:
DMSO intercalate 208
interlayer atoms, surface oxygen in kaolinite:
DMSeO intercalate 208
vermiculite, silicate-layer atoms 177

Intercalation
Al-polyhydroxypolymers with smectites 81
anilinium ions with vermiculite 177
beidellite, hydroxy-Al with 251
benzidine, with vermiculite 203
DMSO, DMSeO with kaolinite 208
kaolinite: hydrazine, induced-stacking faults,
XRD, NMR 38

Interlayer
cation, effect on flocculation of kaolinite, mont-
morillonite 220
cation, effect of basal spacing, layer stacking of
vermiculite and saponite 353
EGME, configuration in montmorillonite 60
hydrotalcite, carbonate, sulfate in 401
manasseite, carbonate in 401
octahedra, structure in ferroan clinochlore 129
thiophenes, polymerization in Cu,Fe-montmoril-
one-tite, IR, Raman spectroscopy 53
water, in vermiculite: anilinium intercalate 177

International Clay Conference
Denver 1985, proceedings, publication of 160

Interpretation of Mössbauer Spectra of Nontronite, Ce-
ladonite, and Glauconite, by L. G. Daynyak and
V. A. Drits 363

Interstratification
CO3-SO4-hydrotalcite, unit-cell parameters, basal
spacings, XRD 401
corrensite, XRD, DTA, TGA, SEM, electron micro-
probe analysis, structural formula, IR 150
determination of, by XRD 111
illite/berthierine, by hydrothermally alteration of
illite, TEM, EDX 241
illite/chlorite, by hydrothermal alteration of basalt
and bentonite, TEM 241
illite/smectite determination by TEM, XRD 74,
77
illite/smectite, by hydrothermal alteration of
basalt 241
illite/smectite in hydrothermal alteration zones
111
illite/smectite, nature of fundamental particles of 74, 77
smectite/chlorite, by hydrothermal alteration of phlogopite 150

**Intervalence Electron Transfer and Magnetic Exchange in Reduced Nontronite**, by P. R. Lear and J. W. Stucki 373

Intervalence electron transfer
ferromagnetic coupling mechanism 373
iron in nontronite, UV-visible spectroscopy 373
IR (see Infrared spectroscopy)

Iron
distribution in phyllosilicates 170
distribution in vermiculite 203
extractable, effects on clay tactoid volume, optical density of vertisol clay suspensions 311
ferrihydrite, lake sediments, DXRD, Mössbauer spectroscopy 297
ferromagnetic coupling mechanism 373
goethite, Al-substituted, lake sediments, DXRD, Mössbauer spectroscopy, unit-cell parameters, DTA 297
hydroxide, noncrystalline, reaction with phosphates, effect of RH 228
-montmorillonite, alcohol adsorption rates, basal spacings 336
-montmorillonite, polymerization of thiophene in interlayer region 53
Mössbauer spectroscopy 170, 203, 297, 363
nontronite, reduced, magnetic susceptibility, Curie constant, Curie-Weiss temperature, UV-VIS spectroscopy 373
octahedral distribution in nontronite, celadonite, glauconite 363
oxidation during weathering of olivine, formation of goethite 418
oxidation state, effect on intervalence electron transfer of nontronite 373
oxide, effect on flocculation of kaolinite, montmorillonite 220
oxide, lake sediments, chemical composition, DXRD, Mössbauer spectroscopy, unit-cell parameters, volume, particle size, DTA 297
oxyhydroxide, dissolution rates, effects of surface area, pH, oxalate concentration, Al substitution 347
reduced, mechanism of dissolution in oxalate solution 347
-rich beidellite in vertisols, structural formula, sediment volume, optical density, UV adsorption 311
-rich chlorite, TEM, EDX, electron diffraction, back-scattered electron image 291
-Si-Al oxyhydroxides, noncrystalline, chemical analysis, TEM, morphology 29
sources, for authigenic chlorite in Gulf Coast sediments 291

substitution in montmorillonite, illite, glauconite 170

**Iron Substitution in Montmorillonite, Illite, and Glauconite by $^{57}\text{Fe}$ Mössbauer Spectroscopy**, by J. H. Johnston and C. M. Cardile 170

Isomers (see also Optically active ligands)
optical, amino acid, adsorption on montmorillonite-Cu-l-lysine complex 391
resolution by HPLC 391

Isotherm
adsorption, quinoline on Na-montmorillonite 121

Jacobsite
Mn-containing, from Mn-ferrihydrite, synthesis, TEM, XRD 11

JANIK, L. J. (with T. T. NGUYEN and M. RAUPACH), Fourier-Transform Infrared Study of Ethylene Glycol Monoethyl Ether Adsorbed on Montmorillonite: Implications for Surface Area Measurements of Clays 60

JAYNES, W. F. (with J. M. BIGHAM), Charge Reduction, Octahedral Charge, and Lithium Retention in Heated, Li-Saturated Smectites 440

JEFFERS, J. D. (with R. C. REYNOLDS, JR.), Expandable Palygorskite from the Cretaceous-Tertiary Boundary, Mangyshlak Peninsula, U.S.S.R. 473

JOHNSTON, J. H. (with C. M. CARDILE), Iron Substitution in Montmorillonite, Illite, and Glauconite by $^{57}\text{Fe}$ Mössbauer Spectroscopy 170

K

K-feldspar
alteration of volcanic ash to 449
K-fixation
in illite/smectite, effect on expandable layers 111

Kaolinite (see also Kaolinite)
alunite in 321
dickite in 321
halloysite in, morphology, SEM 321
hydrothermal, SEM, XRD, IR, DTA, semiquantitative mineralogy 321
illite/smectite in, morphology, SEM 321
kaolinite crystal in, morphology, different particle sizes 321
mineralogy, semiquantitative 321
sedimentary, SEM, XRD, IR, DTA 321
thermal analysis 429

Kaolinite (see also Kaolin)
alter ed volcanic tuff, XRD, petrology 281
authigenic, Gulf Coast sediments, replacement by chlorite 291
bond lengths, angles 33
chemical composition 38
critical coagulation concentration 220
crystal structure 237
crystallinity 321
distribution, Excetto black shale 262
: DMSO intercalate, XRD, IR, NMR, unit-cell dimensions, synthesis, structure 203
: DMSO intercalate, XRD, IR, NMR, unit-cell dimensions, synthesis, structure 203
floculation-dispersion behavior, effect of pH, cation, Al, Fe oxides 220
hydrazine-treated, XRD, NMR 38
hydrogen bonding in 38
hydrothermal, sedimentary, XRD, SEM 321
in saprolites 196
intercalate with DMSO, DMSeO 208
morphismology 291, 321
NMR 38
position of hydrogen in 237
replacement of, by natroalunite, SEM 196
SEM, morphology 196, 321
stacking faults, NMR, XRD 38
XRD 38, 281, 321

Kaolinite, Opal-CT, and Clinoptilolite in Altered Tuffs Interbedded with Lignite in the Jackson Group, Texas, by A. L. Senkayi, D. W. Ming, J. B. Dixon, and L. R. Hossner 281

KERL, W. D. (with GIANNI LOMBARDI and J. D. RUSSELL), Composition and Structural Variations in the Size Fractions of a Sedimentary and a Hydrothermal Kaolin 321

KELSEY, P. I. (with D. CRAW and C. A. LANDIS), Authigenic Chrysotile Formation in the Matrix of Quaternary Debris Flows, Northern Southland, New Zealand 43

Kenyaite
chemical composition, XRD 318
conversion to quartz 318
-magadite stability field diagram 318
synthesis, effect of anions 318

KRELL, R. (with I. SHAINBERG and N. I. ALPEROVITCH), Charge Density and Na-K-Ca Exchange on Smectites 68

KRELL, R. (with L. SHAINBERG, N. ALPEROVITCH, and D. GOLDSTEIN), Effect of Exchangeable Potassium on the Hydraulic Conductivity of Smectite-Sand Mixtures 305

Kinetics
goethite, photochemical dissolution, effects of pH, oxalate concentration. Al-substitution. surface area 347
lepidocrocite, dissolution 347
rate of alcohol sorption on montmorillonite, effects of temperature, particle size, interlayer cation 336
sorption of cyclic ethers on montmorillonite, effects of cation 343

KITAWAGA, RYUI (with ATSUYUKI INOUE, NORIHKO KOHYAMA, and TAKASHI WATANABE), Chemical and Morphological Evidence for the Conversion of Smectite to Illite 111

KODAMA, H. (with C. R. DE KIMPE, N. MILES, and J. DEJOU), Alteration of Phlogopite to Corrensite at Sharbot Lake, Ontario 150

KOHYAMA, NORIHKO (with ATSUYUKI INOUE, RYUI KITAWAGA, and TAKASHI WATANABE), Chemical and Morphological Evidence for the Conversion of Smectite to Illite 111

KOMARNENI, SRIDHAR (with ELSE BREVAL, MICHIIRO MIYAKE, and RUSTUM ROY), Cation-Exchange Properties of (Al + Na)-Substituted Synthetic Tobermorites 385

KRINSLEY, D. H. (with J. H. BURTON and K. PYE), Authigenesis of Kaolinite and Chlorite in Texas Gulf Coast Sediments 291

KO, L.-C. (with Y.-C. YAU, D. R. PEACOR, E. J. ESENNE, J. H. LEE, and M. A. COSCA), Hydrothermal Treatment of Smectite, Illite, and Basalt to 460°C: Comparison of Natural with Hydrothermally Formed Clay Minerals 241

L

LANDIS, C. A. (with D. CRAW and P. I. KELSEY), Authigenic Chrysotile Formation in the Matrix of Quaternary Debris Flows, Northern Southland, New Zealand 43

Laterite
formed from pyroxenite, phyllosilicates in mineral distribution in 1, 196
natroalunite in, replacement of, by kaolinite 196
natroalunite in, SEM, EDX, chemical composition 196
profiles above weathered basalt 196

Layer charge
beidellite 322, 440
effect on interlayer space structure, layer stacking 353
montmorillonite 322, 440
nontronite 322, 440
octahedral, reduction in smectites by Li-uptake, Hofmann-Klenmen effect 440
saponite, effect on layer stacking 353
vermiculite, effect on layer stacking 353

Layer stacking
saponite, effects of interlayer cation, RH 353
vermiculite, effects of interlayer cation, RH, layer charge 353

LEAR, P. R. (with J. W. STUCKI), Intervalance Electron Transfer and Magnetic Exchange in Reduced Nontronite 373

LEE, J. H. (with Y.-C. YAU, D. R. PEACOR, E. J. ESENNE, L.-C. KUO, and M. A. COSCA), Hydrothermal Treatment of Smectite, Illite, and Basalt to 460°C: Comparison of Natural with Hydrothermally Formed Clay Minerals 241
Lepidocrocite
dissolution, rate 347

Lignite
fossilized plant roots in, SEM, electron microprobe analysis 281
stratigraphy, interbedded with volcanic tuff 281

Limburgite glass
noncrystalline Fe-Si-Al oxyhydroxides in, chemical analysis 29

Limestone
concretions in Excello black shale 262

Lithium
retention by smectites, Hofmann-Klemen effect, octahedral layer charge, CEC reduction 440
saturation of smectite in the Greene-Kelly test, swelling 232, 440

Lizardite
Al-Fe-Mg composition, electron microprobe analysis 43
replacement by chrysotile, petrography 43
XRD 43

Llano vermiculite
CMS source clay VTx-1 177, 440
electron microprobe analysis 177

Lombardi, Gianni (with J. D. Russell and W. D. Keller), Composition and Structural Variations in the Size Fractions of a Sedimentary and a Hydrothermal Kaolin 321


Magadrite
-kensait, stability field diagram 318
synthesis, effect of anions 318
XRD 318

Magnetic susceptibility
nontronite, unaltered and reduced, Curie-Weiss temperatures, Curie constants 373
Malla, P. M. (with L. A. Douglas), Problems in Identification of Montmorillonite and Beidellite 232

Manasite
CO$_3$-, XRD, unit-cell parameters, chemical composition, structure, nomenclature 401
chemical composition, XRD, density, structural formula, unit-cell parameters 401
-hydrotalcite group, SEM, nomenclature 401

Manganese
-birnessite, chemical analysis, structural formula, synthesis 271

Manganite
hydrothermal transformation of birnessite to 271
7-Å (birnessite), space group, unit-cell parameters, electron diffraction, IR, XRD, TEM 271
7-Å (birnessite), synthesis, chemical analysis, structural formula 271
space group, structural formula, unit-cell parameters 271

Marcasite
EDX spectrum 281
in fossilized root, interbedded lignite/altered tuff, SEM, electron microprobe 281


Mass transfer
sorption of alcohols on montmorillonite, effects of particle size, temperature, cation 336

Meeting announcement
Euroclay '87 239
24th annual meeting, The Clay Minerals Society 240

Merlinoite
in tuff, alteration of 449

Micropores
expandable palygorskite, sites in, EGME positions in 473

Miles, N. (with C. R. De Kimpe, H. Kodama, and J. Dejou), Alteration of Phlogopite to Corrensite at Sharbot Lake, Ontario 150

Milnes, A. R. (with K. L. Smith and R. A. Eggleton),
Weathering of Basalt: Formation of Iddingsite 418

Mineralogy

- altered tuff, Jackson Group, Texas, XRD 281
- black shale, clay distribution 262
- diagenetic, Yucca Mountain tuffs 89
- iron oxide, lake sediments, DXRD, chemical composition 297
- kaolin, sedimentary, XRD 321
- phosphate nodules, Excelsior black shale 262
- semi-quantitative, XRD, hydrothermal kaolin 321
- silicate, of altered volcanic ash 449
- soils, quantitative determination of clinoptilolite in, CEC, Na-tert-butyl-ammonium exchange 463
- vertisols, clay in 311
- vertisols, Fe-beidellite-rich 305

MING, D. W. (with J. B. DIXON), Technique for the Separation of Clinoptilolite from Soils 469
MING, D. W. (with A. L. SENKAYI, J. B. DIXON, and L. R. HOSSNER), Kaolinite, Opal-CT, and Clinoptilolite in Altered Tuffs Interbedded with Lignite in the Jackson Group, Texas 281
MINGELGRIN, URI (with Faina TSVETKOV), Optically Selective Adsorption of α-Amino Acids on Montmorillonite-Cu-I-Lysine Complexes in High-Pressure Liquid Chromatography 391

Mixed-layering (see also Interstratification)

- hydrotalcite-manasseite group, nomenclature, structural formulae 401

MIYAKE, Michihiro (with Sridhar Komarneni, Else BREVAL, and Rustum ROY), Cation-Exchange Properties of (Al + Na)-Substituted Synthetic Tobermorites 385

Mössbauer spectroscopy

- bendzidine-vermiculite intercalate 203
- celadonite, computer simulation of 363
- ferrihydrite, in lake sediments 297
- glauconite 170, 363
- glauconite, computer simulation of 363
- goethite, in lake sediments 297
- ilomite 170
- iron oxides in lake sediments 297
- montmorillonite 70
- nontronite, computer simulation of 363
- smectite, Ni-Fe-Mg-containing, from weathered pyroxenite 1
- vermiculite-benzidine intercalate 203
- volkonskoite, chromian smectites 139

Molecular configuration

- EGME, liquid 60
- EGME on montmorillonite, surface area 60

Montmorillonite (see also Bentonite, Smectite)

adsorption of quinoline on 121
Al-, Cr-, cyclic ether adsorption rates, basal spacing 343
Al-, Cr-, Fe-, alcohol adsorption rates, basal spacing 336
basal spacing, alkylammonium exchanged 440
beidellite, overgrowths on, TEM, chemical analysis 189
CEC reduction, Li-retention 440
chemical composition 139
critical coagulation concentration 220
cross-linked, hydroxy-SiAl complex, basal spacings, chemical composition, surface area, synthesis, structural formula 429
Cu²⁺-Fe³⁺-, adsorption of thiophene and polymerization in the interlayer region, IR, Raman spectroscopy 53
-Cu-l-lysine complex, use in HPLC to separate optical isomers of amino acids, basal spacing 391
differentiation from beidellite, Greene-Kelly test, alkylammonium exchange 232
EGME complex, IR, ATR, diffuse-reflectance IR-Fourier transform spectroscopy 60
flocculation-dispersion behavior, effect of cation, pH, Al, Fe oxides 220
hydroxy-Al pillared, XRD, basal spacings, surface area, porosity 81
identification, problems, Greene-Kelly test 232
iron substitution in 170
layer charge 440
Li-saturated, exchanged with alkyl-, hexyl-, do-decylammonium ions, basal spacings 232
Mössbauer spectra 170
pillared, hydroxy-SiAl complex 429
structural formula 440

Mordenite

in altered tuffs, Yucca Mountain, Nevada 89

Morphology

- allophane, TEM 29
- chrysotile, authigenic, fibers, TEM 43
- clinoptilolite, coffin-shaped, altered volcanic tuff 281
- epidermal cells of fossilized plant root 281
- ferrihydrite, TEM 21
- gibbsite, platy hexagonal, TEM 379
- goethite, diamond, TEM 418
- goethite, formed from ferrihydrite, pseudo hexagonal, rod-shaped, TEM 21
- goethite, Mn-containing 11
- goethite, TEM 11, 21, 418
- halloysite, hemisphere, SEM 418
- halloysite, SEM 321, 418
- halloysite, spherical, TEM 29
- hematite, ellipsoidal, formed from ferrihydrite, TEM 21
hematite, Mn-containing, TEM 11
hisingerite, spherical, TEM 29
iddingsite, lamellar, TEM 418
illite/smectite, SEM 321
illite/smectite, TEM 111
imogolite, fibers 379
jacobsite, TEM 11
kaolinite, SEM 291, 321
kaolinite, vermicular, back-scattered electron image 291
noncrystalline Fe-Si-Al oxyhydroxides, spherical, TEM 29
opal-CT lepispheres, altered volcanic tuff 281
phosphate nodules, distribution in Excello black shale 262
pyrite, frambooidal, back-scattered electron image 291
pyrite, octahedron, in lignite 281
tobermorite, TEM 385
Murad, Enver (with U. Schwertmann and L. Carlson), Properties of Iron Oxides in Two Finnish Lakes in Relation to the Environment of their Formation 297
Muscovite
- red, Sagn, Norway, structural formula 363

N


Nanzyo, M., Influence of Relative Humidity on the Reaction Products of Phosphates and Noncrystalline Hydroxides of Aluminum and Iron 228

Natrolunitite
- replacement of kaolinite in laterite 196
- XRD, unit-cell dimensions, EDX, structural formula, SEM 196

Natrolunitite in a Laterite Profile over Deccan Trap Basalts at Matanumad, Kutch, India, by D. V. Chitale and Necip Güven 196

Natrolite
- in saprolite, SEM, chemical composition, EDX 196

New Members of the Hydrotalcite-Manasseite Group, by V. A. Drits, T. N. Sokolova, G. V. Sokolova, and V. I. Cherkashin 401

Nguyen, T. T. (with M. Paupach and L. J. Janik), Fourier-Transform Infrared Study of Ethylene Glycol Monoethyl Ether Adsorbed on Montmorillonite: Implications for Surface Area Measurements of Clays 60

Nickel
- talc, EXAFS 1
- smectites, domain segregation in 1

NMR (see Nuclear magnetic resonance)

Nodules
- phosphate, diagenetic replacement of limestone 262
- phosphate, formation of, in Excello black shale 262
- phosphate, morphology 262

Nomenclature
- CO₃-hydrotalcite 401
- CO₃-manasseite 401
- CO₃-SO₄-hydrotalcite 401
- hydrotalcite-manasseite group 401
- montmorillonite, Cr- vs. volkonskoite 139
- SO₄-hydrotalcite 401
- volkonskoite, problems with 139

Noncrystalline
- Al, Fe hydroxides, in preparation of Al phosphate 228
- allopahne, chemical analysis, TEM 29
cordierite, weathered, chemical analysis, TEM 29
- Fe-Si-Al oxyhydroxides, morphology, chemical analysis, TEM 29
- ferrhydrite, chemical analysis, TEM 29
- hisingerite, chemical analysis, TEM 29
- limburgite, chemical analysis 29
- pisolite, lateritic, chemical analysis, TEM 29
- plagioclase, weathered, TEM 29

Noncrystalline Fe-Si-Al-Oxyhydroxides, by R. A. Eggleton 29

Nontronite
- alkylammonium exchanged, basal spacing 232
- atomic positions in unit-cell 363
- CEC reduction, Li-retention 440
- chromian, chemical composition 139
- CMS source clay, NG-1 440
- CMS source clay, SWa-1 373, 440
- EXAFS 1
- layer charge 232, 440
- magnetic susceptibility, Curie constant, Curie-Weiss temperature, UV-VIS spectroscopy 373
- Mg-, K-, Li-saturated, basal spacing 232
- Mössbauer spectroscopy, computer simulation of, electric field gradient calculations 363
- octahedron distribution of Fe in 363
- structural formula 363, 373, 440

Nuclear magnetic resonance (NMR)  
beidellite, H- 251  
beidellite, hydroxy-Al pillared 81, 251  
kaolinite: DMSeO intercalate 208  
kaolinite: DMSO intercalate 208  
kaolinite: hydrazine complex, with stacking faults 38  
pillared smectites 81, 251

Nuclear wastes  
hydrothermal stability of smectite, illite, basalt, possible repository host materials 241  
possible repository site, diagenetic mineral distribution, chemistry, Yucca Mountain, Nevada 89

Octahedral  
cation positions in ferroan clinochlore, order-disorder 129  
layer charge, reduction in smectites, Li-retention, Hofmann-Klemen effect 440

Olivine  
alteration to iddingsite, petrology, SEM, TEM 418  
chemical composition, electron microprobe analysis, EDX, back-scattered electron image 418  
iron oxidation, alteration to goethite 418  
1, 4-Dioxan  
adsorption on Al-, Cr-montmorillonite 343

Opal  
alteration of volcanic ash to 449  
-CT, in fossilized root, interbedded lignite, altered tuff, EDX, SEM, electron microprobe 281  
-CT, lepisphere morphology 281

Open system  
diagenesis of ash-flow tuffs, Yucca Mountain, Nevada 89

Optical absorption spectroscopy  
pimelolite, in weathered pyroxenite 1  
smetite, in weathered pyroxenite 1  
stevensite, in weathered pyroxenite 1

Optical Density of Vertisol Clay Suspensions in Relation to Sediment Volumes and Dithionite-Citrate-Bicarbonate-Extractable Iron, by Eyal Ben-Dor and Arieh Singer 311

Optical density  
vertisol clay suspensions, effects of sediment volume and extractable iron on 311

Optically active ligands  
amino acids, resolution by HPLC using Cu-l-lysine-montmorillonite 391

Optically Selective Adsorption of α-Amino Acids on Montmorillonite-Cu-l-Lysine Complexes in High-Pressure Liquid Chromatography, by Faina Tsvetkov and Uri Mingelgrin 391

Order-disorder  
tetrahedral cations in clinochlore 129  
trivalent octahedral cations in clinochlore 129

Organic carbon  
content, Excello black shale 262

Overgrowths  
on illite and smectite 189

Oxalate  
anion, effect on goethite dissolution kinetics 347  
anion, speciation in solution, effect of pH 347

Oxides  
Al, Fe, effect of, on flocculation-dispersion behavior of clays 220

Oxygen  
-Si bond lengths in kaolinite 38

Parameters  
octahedral, ferroan clinochlore 129  
positional, kaolinite: DMSeO intercalate 208  
positional, kaolinite: DMSO intercalate 208  
positional, vermiculite: anilinium intercalate 177  
tetrahedral, ferroan clinochlore 129  
thermal, atoms in ferroan clinochlore 129

Parameters Influencing Layer Structure Types in Saponite and Vermiculite: A Review, by Hélène Suquet and Henri Pézerat 353

Particle size  
distributions for Na+, Fe3+, Cr3+, and Al3+-montmorillonite 336  
effect on alcohol adsorption on montmorillonite 336  
effect on interlayer space structure of vermiculite and saponite 353  
kaolin, effect on XRD crystallinity, SEM morphology, IR, DTA 321

Peracor, D. R. (with Y.-C. Yau, E. J. Esseen, J. H. Lee, L.-C. Kuo, and M. A. Cosca), Hydrothermal Treatment of Smectite, Illite, and Basalt to 460°C; Comparison of Natural with Hydrothermally Formed Clay Minerals 241

Percent transmittance  
use of, in determination of critical coagulation concentration 220

Permeability (see Hydraulic conductivity)

Petrography  
altered tuff, Jackson Group, kaolin, clinoptilolite, opal-CT in 281
altered volcanic ash, smectite, clinoptilolite, analcime in
basalt, weathered 161, 418
black shale, textures, sedimentary structures 262
chrysotile, authigenic, replacement of lizardite in
debris flow 43
clinoptilolite in altered tuff 89, 281
iddingsite in weathered olivine 418

Petrology of the Desmoinesian Excello Shale of the
Midcontinent Region of the United States, by O.
I. Ece 262

PEZERAT, HENRI (with HELENE SUQUET), Parameters
Influencing Layer Structure Types in Saponite and
Vermiculite: A Review 353

pH
  effect of quinoline adsorption on montmorillonite 121
  effect on flocculation-dispersion behavior of kaolinite, montmorillonite 220
  effect on goethite dissolution kinetics 347

Phillipsite
  in altered tuff 449

Phlogopite
  hydrothermal alteration to corrensite, XRTD, SEM, structural formula 150

Phosphate
  Al, noncrystalline 228
  Ca, dihydrate 228
  Ca, monohydrate 228
  diffuse reflectance IR spectroscopy of 228
  Fe, noncrystalline 228
  fluorapatite, diagenetic formation in black shale 262
  Mg-, dihydrate, preparation 228
  nodule, in black shale, morphology 262
  noncrystalline Al- 228
  noncrystalline Fe- 228
  reactions with noncrystalline Al, Fe hydroxides, effect of RH 228

Photochemical dissolution
  goethite, effects of oxalate concentration, pH, Al-substitution 347

Photochemical Dissolution of Goethite in Acid/
Oxalate Solution, by R. M. Cornell and P. W.
Schindler 347

Phyllomanganate
  7-A, from Mn-ferrihydrite, synthesis, XRD 11
PILC (see Pillared interlayered complex)

Pillared interlayered complex (PILC) (see also Cross-
linked smectite)
  hydrox-Al on beidellite, XRD, basal spacings, surface area, porosity 81, 251
  hydroxy-Al on montmorillonite, XRD, basal spacings, surface area, porosity 81

Pillaring
  as function of tetrahedral substitution mechanisms 81

Pillaring Processes of Smectites With and Without Tetra-
hedral Substitution, by D. Plee, L. Gatineau, and J. J. Fripiat 81

Pimelite
  optical absorption spectroscopy 1

Pisolite
  laterite, noncrystalline Fe-Si-Al oxyhydroxide, chemical analysis, TEM, morphology 29

Plagioclase
  weathered, noncrystalline Fe-Si-Al oxyhydroxide in, TEM, morphology 29

Plant roots
  morphology, epidermal cells, SEM 281
  replacement by marcasite, clinoptilolite, opal-CT, SEM, electron microprobe analysis 281

PLEE, D. (with L. GATINEAU and J. J. FRIPIAT), Pillaring
Processes of Smectites With and Without Tetra-
hedral Substitution 81

Polymerization
  thiophene, reactions in interlayer of Cu$^{2+}$-, Fe$^{3+}$-
  montmorillonite, IR, Raman spectroscopy 53

PONCELOT, G. (with A. SCHUTZ, W. E. E. STONE, and
J. J. FRIPIAT), Preparation and Characterization of
Bidimensional Zeolitic Structures Obtained from
Synthetic Beidellite and Hydroxy-Aluminum
Solutions 251

Porosity
  beidellite, hydroxy-Al pillared 251
  montmorillonite, hydroxy-Al pillared 81

Potassium
  cation exchange on smectite, selectivity coefficient 305
  exchangeable, effect on smectite swelling, hydraulic conductivity 305

Preparation and Characterization of Bidimensional
Zeolitic Structures Obtained from Synthetic Bei-
dellite and Hydroxy-Aluminum Solutions, by A.
Schutz, W. E. E. Stone, G. Poncelet, and J. J.
Fripiat 251

Problems in Identification of Montmorillonite and Bei-
dellite, by P. M. Malla and L. A. Douglas 232

Properties of Iron Oxides in Two Finnish Lakes in
Relation to the Environment of their Formation,
by U. Schwertmann, L. Carlson, and E. Mu-
rad 297

Pseudoboehmite
  authigenic, with chrysotile in debris-flow breccia, IR, DTA, chemical analysis 43

PYE, K. (with J. H. BURTON and D. H. KRINSLEY),
Authigenesis of Kaolinite and Chlorite in Texas
Gulf Coast Sediments 291
Pyrene
adsorption on pillared smectites 81

Pyrite
associated with clinoptilolite in lignite, SEM, electron microprobe 281
framboidal, back-scattered electron image 291

Pyroxenite
weathered, alteration to nontronite, Ni-talc, smectite 1

Quantitative Determination of Clinoptilolite in Soils by a Cation-Exchange Capacity Method, by D. W. Ming and J. B. Dixon 463

Quartz
conversion of kenyaite to 38

Quinoline
adsorption on montmorillonite 121
-Na exchange on montmorillonite 121

Quinoline Sorption on Na-Montmorillonite: Contributions of the Protonated and Neutral Species, by C. C. Ainsworth, J. M. Zachara, and R. L. Schmidt 121

Relative humidity (RH)
effect on layer stacking, basal spacings of vermiculite and saponite 353
effect on reaction of non-crystalline hydroxides with Ca, Mg phosphates 228
effect on water content of Ca, and Mg phosphates 228


REYNOLDS, R. C., JR. (with J. D. JEFFERS), Expandable Palygorskite from the Cretaceous-Tertiary Boundary, Mangyshlak Peninsula, U.S.S.R. 473

RH (see Relative humidity)

Rheology
charge density, Na-K-Ca exchange on smectites 68
kaolinite, effect of saturating cation, pH, Al, Fe oxides on flocculation of 220
montmorillonite, effect of saturating cation, pH, Al, Fe oxides on flocculation of 220
smectite-sand mixtures, effect of exchangeable K on hydraulic conductivity 305

ROY, RUSTUM (with SRIDHAR KOMARNENI, ELSE BREVAL, and MICHIIRO MIYAKE), Cation-Exchange Properties of (Al + Na)-Substituted Synthetic Tobermorites 385

RULE, A. C. (with S. W. BAILEY), Refinement of the Crystal Structure of a Monoclinic Ferroan Clinochlore 129

RUSSELL, J. D. (with GIANNI LOMBARDI and W. D. KELLER), Composition and Structural Variations in the Size Fractions of a Sedimentary and a Hydrothermal Kaolin 321

S

SAD (see Selected-area electron diffraction)
Saline lake
alkaline, diagenesis of volcanic ash to zeolites in 449

Salinity
effect on hydraulic conductivity of smectite-sand mixture 305

Sand
-smectite mixtures, hydraulic conductivity 305
Saponite (see also Montmorillonite, Smectite)
alkylammonium exchanged, basal spacings 440
Ba-, SAD 353
basal spacings, effects on interlayer cation, RH 353
CEC reduction, Li-retention 440
in weathered olivine, TEM, AEM 418
layer charge 353, 440
layer stacking, effects of interlayer cation, RH 353
source clay, CMS, SapCa-I 440
structural formula 353, 440

Saprolite
kaolinite in, SEM 196
natroaluminate in saprolite 196

Scanning electron microscopy (SEM)
binnessite, 7-Å manganite 271
buserite 271
clorite, authigenic, Gulf Coast sediments 291
clay overgrowths, STEM 189
clinoptilolite 281, 458, 469
clinoptilolite, in soils 469
clinoptilolite, morphology 281
corrensiste in hydrothermally altered phlogopite 150
fossilized plant root in lignite 281
goethite, synthetic 21
halloysite, in hydrothermal kaolin, morphology 321, 418
halloysite in weathered olivine, back-scattered electron image 418
hydrotalcite-manasseite 401
iddingsite, in weathered olivine 418
illite/smectite, morphology 321
kaolinite, morphology 321
natroaluminate in saprolite 196
opal-CT, morphology 281
phlogopite 150
pyrite, framoidal, Gulf Coast sediments 291
pyrite, morphology 281
smectite, bentonite 241
smectite, Ni-Fe-Mg-, in weathered pyroxenite 1

Schindler, P. W. (with R. M. Cornell), Photochemical Dissolution of Goethite in Acid/Oxalate Solution 347


Schmidt, R. L. (with C. C. Ainsworth and J. M. Zachara), Quinoline Sorption on Na-Montmorillonite: Contributions of the Protonated and Neutral Species 121

Schultz, P. K. (with P. G. Slade, C. Dean, and P. G. Self), Crystal Structure of a Vermiculite-Anilinium Intercalate 177

Schutz, A. (with W. E. E. Stone, G. Poncelot, and J. J. Fripiat), Preparation and Characterization of Bidimensional Zeolitic Structures Obtained from Synthetic Beidellite and Hydroxy-Aluminum Solutions 251

Schwertmann, U. (with L. Carlson and E. Murad), Properties of Iron Oxides in Two Finnish Lakes in Relation to the Environment of their Formation 297

Searlesite
in altered tuff, Searles Lake, California 449

Selected-area electron diffraction (SAD)
kaolinite 237
saponite, Ba- 353
smectite, from weathered pyroxenite 1
vermiculite, Ba- 353

Selectivity coefficient
effect of layer charge density on 68
Gaines-Thomas 68
Gapon 68, 305
K-Ca on smectite 68
K-Na on smectite 68, 305
Na-Ca on clinoptilolite 458
Na-Ca on smectite 68
Na-Cs on tobermorite 385
Na-NH4, Na-Ca, on clinoptilolite 458
quinoline-Na, on montmorillonite 121
Vanselow 68

Self, P. G. (with P. G. Slade, C. Dean, and P. K. Schultz), Crystal Structure of a Vermiculite-Anilinium Intercalate 177

SEM (see Scanning electron microscopy)

Senkayi, A. L. (with D. W. Ming, J. B. Dixon, and L. R. Hossner), Kaolinite, Opal-CT, and Clinoptilolite in Altered Tufts Interbedded with Lignite in the Jackson Group, Texas 281

Serpentine
asbestos formation in debris flow 43
lizardite, replacement by chrysotile, petrography, XRD 43

Shabtal, Joseph (with Johan Sterte), Cross-linked Smectites. V. Synthesis and Properties of Hydroxy-Silicoaluminum Montmorillonites and Fluorhectorites 429

Shainberg, I. (with N. I. Alperovitch and R. Keren), Charge Density and Na-K-Ca Exchange on Smectites 68

Shainberg, I. (with R. Keren, N. Alperovitch, and D. Goldstein), Effect of Exchangeable Potassium on the Hydraulic Conductivity of Smectite-Sand Mixtures 305

Shale
Albian, overgrowth structures formed during diagenesis 189
black, Exello, petrography, mineralogy, diagenesis, XRD 262
collophane concretions in 262
SHAWE, D. R. (with E. E. FOORD, H. C. STARKEY, and J. E. TAGGERT, Jr.), Reassessment of the Volkonskoite-Chromian Smectite Nomenclature Problem 139

Silica

loss during alteration of volcanic ash 449
silicate species in solution, effect on morphology of goethite, hematite formed from ferrihydrite 21

Silicate layer

Llano vermiculite, interatomic distances, angles 177
Llano vermiculite, structure 177

Silication

zeolites in interbedded lignite/volcanic tuff 281
Silicification

of illite and smectite, diagenesis 189

Silicon

clinoptilolite in lignite, electron microprobe dot map of 281
fossilized plant root, electron microprobe map of distribution 281
-O bond lengths, Si...H distances in kaolinite 38
SINGER, ARIEH (with EYAL BEN-DOR), Optical Density of Vertisol Clay Suspensions in Relation to Sediment Volumes and Dithionite-Citrate-Bicarbonate-Extractable Iron 311

SLADE, P. G. (with C. M. CARDILE), Structural Study of a Benzidine-Vermiculite Intercalate having a High Tetrahedral-iron Content by 57 Fe Mössbauer Spectroscopy 203

SLADE, P. G. (with C. DEAN, P. K. SCHULTZ, and P. G. SELF), Crystal Structure of a Vermiculite-Anilinium Intercalate 177

Smectite (see also Bentonite, Montmorillonite)

alkylammonium exchanged, basal spacing 440
altered tuff, XRD 281
beidellite, chromian, chemical composition, XRD 139
beidellite, Fe-rich, in vertisols, structural formula, optical density, UV absorption, tactoid volume 311
bentonite, SEM, EDX, TEM 241
CEC reduction, Li-retention, Hofmann-Klemen effect 440
charge density, effect on swelling of 68, 305
/chlorite, XRD, TGA, IR, DTA, SEM, chemical analysis 150
chromian, volkonskoite nomenclature 139
conversion to illite, K-fixation, dissolution-precipitation mechanism 111
diagenetic, beidellite overgrowths on, TEM, chemical analysis 189
differentiation by the Greene-Kelly test 232
effect of variable states of collapse on illite/smectite particle thickness, TEM 74

EXAFS 1
exchangeable Li, effect on swelling of 305
fluorhectorite, hydroxy-SiAl cross-linked, basal spacings, surface area, structure, thermal stability 429
fluorhectorite, synthesis 429
hydrothermal alteration with basalt 241
hydroxy-SiAl cross-linked, basal spacings, chemical composition, surface area, synthesis, structural formula, thermal stability 429
/illite, hydrothermal alteration of bentonite, TEM, XRD 241
/illite, hydrothermal alteration of volcanic glass, AEM, TEM, XRD 321
/illite, in hydrothermal kaolin, morphology, SEM, XRD 311
/illite, interstratified, fundamental particles 74, 77
/illite, source of iron for chlorite authigenesis, Gulf Coast sediments 291
/illite, underclays in black shale sequence 262
in altered volcanic ash, petrography 418, 449
in vertisol clay suspensions, UV-VIS spectroscopy 311
in weathered basalts 161
layer charge 440
Na-K-Ca exchange, effect of 2:1 layer charge density 68
Ni-Fe-Mg-, in weathered pyroxenite, XRD, TEM, SEM, IR, electron microprobe analysis, optical absorption spectra, Mössbauer spectra 1
pillared, pyrene adsorption on 81
pillaring with aluminum-polyhydroxy polymers 81
quantitative determination in soils, CEC, Na+-NH₄+-tertbutylammonium exchange 463
saponite, in weathered olivine, TEM, SEM 418
stability, hydrothermal conditions 241
/to-illite transformation, mechanism 111
swelling, effect on hydraulic conductivity 305
volkonskoite, XRD, TGA, Mössbauer spectroscopy, chemical composition 139
SMITH, K. L. (with A. R. MILNES and R. A. EGGLETON), Weathering of Basalt: Formation of Iddingsite 418

Sodium

-Ca exchange on clinoptilolite, selectivity coefficient 458
-Cs exchange on tobermorite, exchange coefficient 385
exchangeable, effect on hydraulic conductivity of smectite-sand mixtures 305
-K exchange on smectite, selectivity coefficients 305
-NH₄+ exchange on clinoptilolite, selectivity coefficient 458
-NH₄⁺ exchange on clinoptilolite, in quantitative determination in soils 463
substitution in synthetic tobermorite, CEC, basal spacing, morphology 385
tertbutylammonium exchange on clinoptilolite 463

Sodium, Calcium, and Ammonium Exchange on Clinoptilolite from the Fort LaClede Deposit, Sweetwater County, Wyoming, by M. H. Hulbert 458

clinoptilolite in, quantitative analysis by CEC, XRD 463
heavy liquid separation of clinoptilolite in vertisol clay suspensions, optical density, relation to sediment volume, extractable Fe 311

Sokolova, G. V. (with V. A. Drits, T. N. Sokolova, and V. I. Cherkašin), New Members of the Hydrotalcite-Manaselite Group 401

Sokolova, T. N. (with V. A. Drits, G. V. Sokolova, and V. I. Cherkašin), New Members of the Hydrotalcite-Manaselite Group 401

Soma, Mitsuyuki (with Yuko Soma, Yukio Furukawa, and Issei Harada), Reactions of Thiophene and Methylthiophenes in the Interlayer of Transition-Metal Ion-Exchanged Montmorillonite Studied by Resonance Raman Spectroscopy 53

Soma, Yuko (with Mitsuyuki Soma, Yukio Furukawa, and Issei Harada), Reactions of Thiophene and Methylthiophenes in the Interlayer of Transition-Metal Ion-Exchanged Montmorillonite Studied by Resonance Raman Spectroscopy 53

Sorption (see also Adsorption)
isotherms, quinoline on montmorillonite 121

Source clays, CMS hectorite, SHCa-1, CEC, Li-retention, layer charge reduction, alkylammonium exchange, basal spacings 440
kaolinite, KGa-1, flocculation of 220
montmorillonite, SAz-1, CEC, Li-retention, layer charge reduction, alkylammonium exchange 440
montmorillonite, SAz-1, flocculation of 220
montmorillonite, SCA2, CEC, Li-retention, layer charge reduction, alkylammonium exchange, basal spacings 440
montmorillonite, STx-1, CEC, Li-retention, layer charge reduction, alkylammonium exchange, basal spacings 440
montmorillonite, SWy-1, problems in differentiation from beidellite 232
montmorillonite, SWy-1, quinoline adsorption on 121

montmorillonite, SWy-1, CEC, Li-retention, layer charge reduction, alkylammonium exchange, basal spacings 440
nontronite, NG-1, reduced, intervalence electron transfer, magnetic exchange 373
nontronite, NG-1, CEC, Li-retention, layer charge reduction, alkylammonium exchange, basal spacings 232, 440
nontronite, SWa-1, CEC, Li-retention, layer charge reduction, alkylammonium exchange, basal spacings 232, 440
nontronite, SWa-1, reduced, intervalence electron transfer, magnetic exchange 373
saponite, SapCa-1, CEC, Li-retention, layer charge reduction, alkylammonium exchange, basal spacings 440
vermiculite, VTx-1, CEC, Li-retention, layer charge reduction, alkylammonium exchange, basal spacings 440

Space group
birenessite (7-Å manganite), synthetic 271
chlorite, ferroan, clinohlore 129
cryptomelane 271
ferroan clinohlore, ideal refinement of ideal 129
hollandite 271
manganese oxides 271
manganite 271
todorokite (10-Å manganite) 271

Special clays, CMS (see Source clays, CMS)
Specific gravity (see Density)
Stability
diagram, kenyaita-magadilite 318
smectite, illite, under hydrothermal conditions 241

Stacking fault
in kaolinite : hydrazine intercalate, effects on NMR spectra, hydrogen bonding 38

Starkey, H. C. (with E. E. Foord, J. E. Taggert, Jr., and D. R. Shawe), Reassessment of the Volkonskoite-Chromian Smectite Nomenclature Problem 139

Steinberg, Michel (with Thierry Holtzappfel and Michel Rautureau), Characterization of Overgrowth Structures Formed around Individual Clay Particles during Early Diagenesis 189
Sterte, Johan (with Joseph Shabtai), Cross-linked Smectites. V. Synthesis and Properties of Hydroxy-Silicoaluminum Montmorillonites and Fluorohectorites 429
Stone, W. E. E. (with A. Schutz, G. Poncelet, and J. J. Fripiat), Preparation and Characterization of Bidimensional Zeolitic Structures Obtained from
| Synthetic Beidellite and Hydroxy-Aluminum Solutions | 251 |
| Stratigraphy |  |
| Excello black shale sequence | 262 |
| Jackson Group, interbedded lignite and volcanic tuffs | 281 |
| Searles Lake sediments | 449 |
| Yucca Mountain, Nevada, volcanics | 89 |
| Structural formula |  |
| alunite | 196 |
| beidellite, chromian | 139 |
| beidellite, Fe-rich | 311 |
| birnessite (7-Å manganate) | 271 |
| celadonite | 363 |
| clinoptilolite | 469 |
| CO$_3$-hydritalcite | 401 |
| CO$_3$-manasacite | 401 |
| CO$_3$-SO$_4$-hydritalcite | 401 |
| corrensite | 150 |
| cryptomelane | 271 |
| fluorhectorite | 429 |
| glauconite | 170, 363 |
| hectorite, CMS source clay CHCa-1 | 440 |
| hollandite | 271 |
| hydroxy-SiAl montmorillonite | 429 |
| illite | 170 |
| manasacite | 401 |
| mangante | 271 |
| montmorillonite | 139, 170, 311, 363, 373, 440 |
| montmorillonite, CMS source clay SAz-1 | 440 |
| montmorillonite, CMS source clay SCa-2 | 440 |
| montmorillonite, CMS source clay SWy-1 | 440 |
| muscovite, red | 363 |
| natroalunite | 196 |
| nontronite | 363, 373, 440 |
| nontronite, CMS special clay SWa-1 | 373, 440 |
| nontronite, NG-1 | 440 |
| phlogopite | 150 |
| saponite | 353, 440 |
| saponite, CMS special clay SapCa-1 | 440 |
| smectite, iron-rich beidellite, in vertisols | 311 |
| SO$_4$-hydritalcite | 401 |
| tobormorite | 385 |
| todorokite | 271 |
| vermiculite | 203, 353, 440 |
| vermiculite, CMS special clay VTx-1 | 440 |
| volkonskite | 139 |
| Structural Study of a Benzidine-Vermiculite Intercalate having a High Tetrahedral-Iron Content by $^5$Fe Mössbauer Spectroscopy, by C. M. Cardile and P. G. Slade | 203 |
| Structure (see Crystal structure) |  |

**Sulfate**

- anion, in interlayer of hydrotalcite-manasacite, mixed-layer with carbonate | 401 |
- hydrotalcite, XRD, structural formula, unit-cell parameters, density, nomenclature, structure | 401 |

**Sulfur**

- fossilized plant root, electron microprobe dot map | 281 |
- pyrite in lignite, electron microprobe dot map | 281 |

**SUQUET, Hélène (with Henri Pézerat), Parameters Influencing Layer Structure Types in Saponite and Vermiculite: A Review | 353**

**Surface area**

- cross-linked smectite | 429 |
- EGME adsorbed on montmorillonite | 60 |
- goethite, effect on photochemical dissolution kinetics | 347 |
- hydroxy-Al pillared beidellite | 81, 251 |
- hydroxy-Al pillared montmorillonite | 81 |
- hydroxy-SiAl fluorhectorite, effect of heat | 429 |
- hydroxy-SiAl montmorillonite, effect of heat | 429 |
- smectites | 68, 305 |
- vertisols | 311 |

**Swelling**

- dispersion, difference between | 305 |
- hydraulic conductivity, effect on | 305 |
- smectite, after Li-saturation | 440 |
- smectite, effect of 2:1 layer charge density | 68, 305 |
- smectite, effect of exchangeable potassium on | 68, 305 |

**Synthesis**

- Al hydroxide | 228 |
- Al oxide | 220 |
- beidellite, from gel | 81, 251 |
- birnessite, 7-Å manganate | 271 |
- cross-linked smectite, hydroxy-silicoaluminum montmorillonite, fluorhectorite | 429 |
- Fe hydroxide | 228 |
- Fe oxide | 220 |
- ferrihydrite, Mn-containing | 11 |
- fluorhectorite | 429 |
- goethite, from ferrihydrite in presence of silicate species | 21 |
- goethite, Mn-containing, from ferrihydrite | 11 |
- hematite, from ferrihydrite in presence of silicate species | 21 |
- hematite, Mn-containing, from Mn-ferrihydrite | 11 |
- hydroxy-SiAl oligomers | 429 |
- imogolite | 379 |
- jacobsite, Mn-containing, from Mn-ferrihydrite | 11 |
- kaolinite: DMSO intercalate | 208 |
- kaolinite: DMSeO intercalate | 208 |
kenyaite, effect of anions 318
magadiite, effect of anions 318
phyllomanganate, 7-Å, from Mn-ferrihydrite 11
tobermorite, Al-, Na-substituted 385

**Synthesis of Kenyaite and Magadiite in the Presence of Various Anions**, by R. A. Fletcher and D. M. Bibby 318

Tactoid dimensions, effects of sediment volume and extractable Fe on 311
fabric, particle arrangement in vertisol clay suspensions 311

**Taggert, J. E., Jr.** (with E. E. Foord, H. C. Starkey, and D. R. Shawe), Reassessment of the Volkonskite-Chromian Smectite Nomenclature Problem 139

**Tait, J. M.** (with P. H. Nadeau, M. J. Wilson, and W. J. McHardy), Fundamental Nature of Intersaturated Illite/Smeectite Clay Particles, The: A Reply 77

Talc
Ni-, EXAFS 1

**Technique for the Separation of Clinoptilolite from Soils**, by D. W. Ming and J. B. Dixon 469

**TEM** (see Transmission electron microscopy)

**Temperature**
effect on alcohol adsorption rate on montmorillonite 336

Terbutylammonium
Na+ exchange on clinoptilolite, for quantitative mineralogy 463

Tetrahedral
substitution effects on intercalation of smectites with Al polyhydroxypolymers 81
substitution in ferroan clinohloere 129

**Tetrahydrofluran**
adsorption on Al-, Cr-montmorillonite 343

**Tetrahydropran**
adsorption on Al-, Cr-montmorillonite 343

**TGA** (see Thermal gravimetric analysis)
hydroxy-SiAl fluorhectorite, surface area, basal spacing 429
hydroxy-SiAl montmorillonite, surface area, basal spacing 429

**Thermal analysis** (see Differential thermal analysis, Thermal gravimetric analysis)

**Thermal stability**
cross-linked smectics, changes in surface area, basal spacing 429

**Thermodynamics**

**Thermogravimetric analysis (TGA)**
corrrensite 150
smectite, chromian 139
volkonskite 139

Thiophene
adsorption on Cu2+, Fe3+-montmorillonite 53
polymerization in interlayer of montmorillonite, IR, Raman spectroscopy 53

**Thompson, J. G.** (with P. F. Barron), Further Consideration of the 29Si Nuclear Magnetic Resonance Spectrum of Kaolinite 38

**Thompson, J. G.** (with M. Raupach and P. F. Barron), Nuclear Magnetic Resonance, Infrared, and X-ray Powder Diffraction Study of Dimethylsulfoxide and Dimethylselenoxide Intercalates with Kaolinite 208

**Thompson, J. G.** (with R. L. Withers), Transmission Electron Microscopy Contribution to the Structure of Kaolinite, A 239

**Tobermorite**
Al- and Na-substituted, synthesis, structural formula 385
basal spacing, TEM, XRD, CEC, Na-Cs exchange, TEM, morphology 385

**Todorokite**
hydrothermal transformation of birnessite 271
manganese oxide 271
space group, unit-cell parameters 271
structural formula 271
10-Å manganese, IR, chemical analysis 271


**Transmission Electron Microscopy Contribution to the Structure of Kaolinite, A**, by J. G. Thompson and R. L. Withers 239

**Transmission electron microscopy (TEM)**
allophane, noncrystalline Fe-Si-Al oxyhydroxides, spherical morphology 29
berthierine, hydrothermally altered illite 241
birnessite, saturated with Ca, Mg, Ni, Co, La 271
chlorite, authigenic, Fe-rich, in Gulf Coast sediments 291
chlorite, in hydrothermally altered basalt, bentonite 241
chryso, fibrous 43
cordierite, weathered 29
ferrihydrite, spherical morphology 29
gibbsite, platey hexagonal 379
gibbsite, platy morphology 379
goethite, formed from ferrihydrite, function of silicate species in solution 21

goethite, in weathered olivine 418
halloysite, hemispherical, in weathered olivine 418
halloysite, in weathered cordierite, spherical morphology 29
hematite, ellipsoidal, formed from ferrihydrite 21
hematite, Mn-, synthetic 11
hisingerite, spherical morphology 29
hydroxy-Al beidellite complex 251
iddingsite, lamellar in weathered olivine 418
illite/berthierine, in hydrothermally altered illite 241
illite/smectite, errors associated with particle thickness determination 74, 77
illite/smectite from hydrothermally altered volcanic glass 111
immiscible glass in basalt 241
imogolite, fibrous morphology 379
imogolite, synthetic 379
jacobsite, synthetic 11
lateritic pisolite, spherical morphology 29
overgrowth structures on illite and smectite 189
Mn-goethite, synthetic 11
noncrystalline Fe-Si-Al oxyhydroxides
plagioclase, weathered, spherical morphology 29
smectite, in bentonite 241
smectite, Mn-Fe-Mg-, from weathered pyroxenite 1
smectite, saponite, spherical, in weathered olivine 418
tobormorite, synthetic, crystal morphology 385
TRESCASES, J. J. (with A. DECARREAU, F. COLIN, A. HERBILLON, A. MANCEAU, D. NAHON, H. PAQUET, and D. TRAUTH-BADAUD), Domain Segregation in Ni-Fe-Mg-Smectites 1
TSVETKOV, FAINA (with URI MINGELGRIN), Optically Selective Adsorption of α-Amino Acids on Montmorillonite-Cu-I-Lysine Complexes in High-Pressure Liquid Chromatography 391
Tuff
alteration to feldspar 89
alteration to opal-CT 281
alteration to zeolites 89, 281
altered, XRD, petrography, SEM 281
bulk-rock composition 89
kaolinite, clinoptilolite in, replacement of volcanic glass 281
silicate mineralogy of, Searles Lake, California 449
zeolitic, composition 89
U
Ultraviolet-visible spectroscopy (UV-VIS)
nontronite, effects of intervalence electron transfer 373
smectite, vertisol clay suspensions 311
Unit-cell
alunite 196
kaolinite 208
kaolinite: DMSO intercalate 208
kaolinite: DMSO intercalate 208
natroalunite 196
nontronite 363
parameters, CO₃-hydrotalcite, XRD 401
parameters, CO₃-hydrotalcite, XRD 401
parameters, CO₃-SO₄-hydrotalcite 401
parameters, SO₄-hydrotalcite, XRD 401
parameters, birnessite, 7-Å-manganite 271
parameters, cryptomelane 271
parameters, goethite in lake sediments 297
parameters, hollandite 271
parameters, manasseite, XRD 401
parameters, manganite 271
parameters, todorokite 271
parameters, vermiculite: anilinium intercalate 177
volume, goethite, effect of Al substitution on 297
UV-VIS (see Ultraviolet-visible spectroscopy) V
Vanelslow selectivity
Na-Ca-K exchange on smectite 68
quinoline-Na exchange on montmorillonite 121
VAN OLPHEN, H., book review, Clay Microstructure, by R. H. Bennett and M. H. Hurlbut 400
Vapor
alcohol, adsorption on montmorillonite, kinetics, effects of particle size, cation, temperature 343
cyclic ether, adsorption on montmorillonite, kinetics, effects of cation, temperature 343
water, effect on basal spacings of Al-, Cr-, Fe³⁺- exchanged montmorillonite 336
Vapor-Phase Sorption Kinetics for Methanol, Propan-2-ol, and 2-Methylpropan-2-ol on Al³⁺-, Cr³⁺-, and Fe³⁺-Exchanged Montmorillonite, by C. Breen, A. T. Deane, J. J. Flynn, and D. Reynolds 336
Vapor-Phase Sorption Kinetics for Tetrahydrofluran, Tetrahydropan, and 1,4-Dioxan by Al³⁺- and Cr³⁺- Exchanged Montmorillonite, by C. Breen, A. T. Deane, and J. J. Flynn 343
VARKEVISser, DANe (with R. A. EgGLETON and CHRIS FOUDouLIS), Weathering of Basalt: Changes in Rock Chemistry and Mineralogy 161
Vermiculite
alkylammonium exchanged, basal spacings 440
-anilinium intercalate, crystal structure, unit-cell parameters, electron microprobe analysis 177
Ba-, SAD 353
basal spacing, effects of layer charge, interlayer cation, RH 353
-benzidine intercalate, Mössbauer spectroscopy 203
CEC reduction, Li-retention 440
electron microprobe analysis 177
Fe distribution in 203
intercalation of anilinium on 177
intercalation with benzimidinium ion 203
layer charge 353, 440
layer stacking, effects on interlayer cation, RH 353
source clay, CMS, VTx-1 440
structural formula 203, 353, 440

Vertisol
surface area, CEC, chemical composition, mineralogy, UV-absorption spectroscopy 311
suspensions, optical density of, relation with extractable iron, tactoid volume 311

Volcanic ash
clinoptilolite, alteration to 281
diagenetic alteration in alkaline, saline lake 449
electron microprobe analysis 80
illite/smectite, hydrothermal alteration to 111
K-feldspar, alteration to 449
merlinoite, alteration to 449
phillipsite, alteration to 449
replacement by zeolites 89
searlesite, alteration to 449
smectite, alteration to 161, 449
tephra, alteration to zeolites and K-feldspar 449
zeolite formation in, in alkaline, saline lake deposits 449

Volkonskoite
Cr-bearing chlorite, relation to 139
Cr-bearing smectite, chemical composition, Mössbauer spectroscopy, structural formula, TGA, XRD 139
omenclature problem 139

WADA, SHIN-ICHIRO, Imogolite Synthesis at 25°C 379

Wairakite
hydrothermal alteration of Bentonite, basalt to, XRD 241

WARREN, R. G. (with D. E. BROXTON and D. L. BISH), Distribution and Chemistry of Diagenetic Minerals at Yucca Mountain, Nye County, Nevada 89

WATANABE, TAKASHI (with ATSUYUKI INOUE, NORIHICO KOHYAMA, and RYUJI KITAWAGA), Chemical and Morphological Evidence for the Conversion of Smectite to Illite 111

Water vapor, effect on basal spacings of Al-, Cr-, Fe3+-exchanged montmorillonite 336

Weathering
basalt 161, 196, 418
basalt, alteration to smectite, goethite, halloysite 161
cordierite, alteration to halloysite, noncrystalline Fe-Si-Al oxyhydroxides 29
density as measure of intensity 161
olivine in basalt, iron oxidation, alteration to goethite, smectite, iddingsite, halloysite 418

Weathering of Basalt: Changes in Rock Chemistry and Mineralogy, by R. A. Eggleton, Chris Foudoulis, and Dane Varkevisser 161


WITHERS, R. L. (with J. G. THOMPSON), Transmission Electron Microscopy Contribution to the Structure of Kaolinite, A 239

X

X-ray powder diffraction (XRD)
 altered volcanic tufts, kaolinite, smectite, clinoptilolite in 281
anilinium-vermiculite intercalate 177
beidellite 81, 139, 232, 251
beidellite, chromian 139
beidellite, exchanged with alkylammonium 232
beidellite, hydroxy-Al pillared, basal spacings 81, 251
beidellite, K-, Li-, Mg-saturated, basal spacings 232
binnellite, 7-Å manganite 271
black shale, Excello, clay mineralogy by 262
chlorite, hydrothermal alteration of basalt, bentonite 241
chrysotile, authigenic after lizardite 43
clinoptilolite 43, 463, 469
clinoptilolite in soil 469
clinoptilolite, quantitative determination 463
CO3-hydrotalcite, unit-cell parameters, basal spacings 401
CO3-manasseite, unit-cell parameters, basal spacings 401
CO3-SO4-hydrotalcite, basal spacings 401
corrensite, basal spacings, Fourier synthesis 150
goethite, Mn-containing 11
halloysite, in hydrothermal kaolin deposit 321
illite/chlorite, hydrothermal alteration of bentonite, basalt 241
illite/smectite, in hydrothermal kaolin deposit 321
illite/smectite, in hydrothermally altered volcanic glass 111
illite/smectite, interpretations of fundamental particle thickness 74, 77
jacobsite 11
kaolin, hydrothermal, different particle sizes,
kaolinite crystallinity, semiquantitative mineralogy 321
kaolin, sedimentary, different particle sizes, kaolinite crystallinity 321
kaolinite 38, 208, 281
kaolinite, authigenic, in altered tuff 281
kaolinite, hydrazine-treated 38
kaolinite: DMSO intercalate 208
kaolinite: DMSO intercalate 208
kenyaite 318
lizardite 43
magadiite 318
manasseite 401
mineralogy of Excello black shale by 262
monocalcium phosphate 228
montmorillonite 81, 139, 208, 232
montmorillonite, alkylammonium exchanged 232
montmorillonite, chromian 139
montmorillonite, hydroxy-A1 pillared, basal spacings 81
montmorillonite, K-, Li-, Mg-saturated, basal spacings 232
natroalunite, unit-cell dimensions 196
nontronite, alkylammonium exchanged 232
nontronite, K-, Li-, Mg-saturated, basal spacings 232
palygorskite, expandable 473
phlogopite 150
phyllomanganate 11
smectite/chlorite 150
smectite, Ni-Fe-Mg-, from weathered pyroxenite 1
SO₄-hydrotalcite 401
tobermorite, synthetic, basal spacing 385
volkonoskite 139
wairakite, hydrothermal alteration of bentonite, basalt 241

XRD (see X-ray powder diffraction)

Y
Yau, Y.-C. (with D. R. Peacor, E. J. Essene, J. H. Lee, L.-C. Kuo, and M. A. Cosca), Hydrothermal Treatment of Smectite, Illite, and Basalt to 460°C: Comparison of Natural with Hydrothermally Formed Clay Minerals 241

Z
Zachara, J. M. (with C. C. Ainsworth and R. L. Schmidt), Quinoline Sorption on Na-Montmorillonite: Contributions of the Protonated and Neutral Species 121
Zeolites (see also individual minerals)
analcime 89, 449
clinoptilolite 89, 449, 463, 469
clinoptilolite in altered tuff 89, 449
clinoptilolite in lignite, altered glass, EDX, morphology, SEM, electron microprobe 281
clinoptilolite, heavy liquid separation from soil, XRD, SEM, structural formula 469
clinoptilolite, Na-, Ca-, NH₄-exchange selectivity 458
clinoptilolite, quantitative determination in soils, CEC, XRD 463
diagenesis of volcanic glass 449
heulandite in altered tuff 89
in altered tuffs 89
merlinoite in altered tuff 449
mordenite in altered tuff 89
natrolite in saprolite 196
phillipsite in altered tuff 449
replacement of volcanic glass 89
silication of interbedded lignite/altered tuff 281
zeolitic structures, bidimensional, formation from beidellite and hydroxy-Al solutions 251