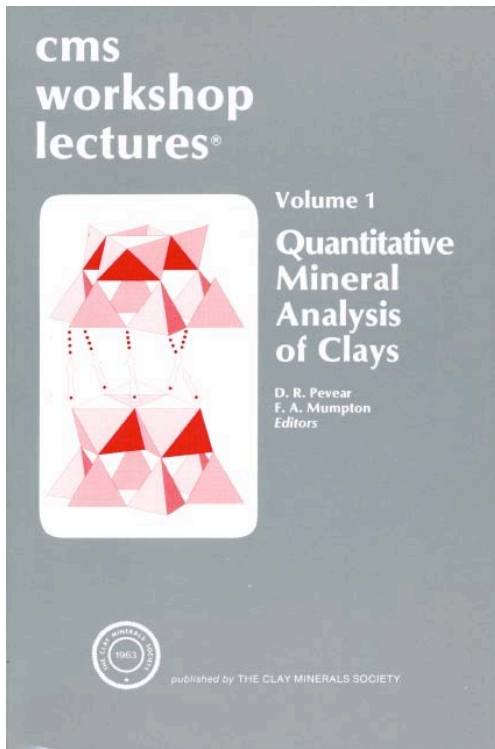


**Workshop Lectures
The Clay Minerals Society
Volumes 1 to 16
Tables of Contents**



Volume 1, 1989, Quantitative Mineral Analysis of Clays

D. R. Pevear & F. A. Mumpton, Editors

Introduction.....D. R. Pevear

Principles and Techniques of Quantitative Analysis of Clay Minerals by X-ray Powder Diffraction.....R. C. Reynolds

Introduction

Equations for Quantitative Analysis

Basic quantitative diffraction equation

Derivation of a working form of the equation for analysis

Required Sample Characteristics

Sample length

Sample thickness

2:1 alignment of the sample

Mineral homogeneity of the sample

Preferred Orientation

Effect of σ^* on absolute intensity

The angle-dependent effect of σ^*

Minimizing Compositional Effects

Peak selection

Mineral Reference Intensities

Use of calculated mineral intensity factors

Experimentally measured mineral reference intensities

Comparison of calculated and measured reference intensities

Calculated mineral reference intensities

Practical examples of application of reference intensities

Summary and Conclusions

References Cited

A Computer Program for Semi quantitative Mineral Analysis by X-ray Powder Diffraction.....J. W. Hosterman and F. T. Dulong

Introduction

User-Supplied Data

Description of the Program

Data smoothing

Background determination

Diffuse scattering

Peak identification

Estimating mineral percentages

Program Output File

Discussion and Summary

Acknowledgments

References Cited

A Computer Technique for X-ray Diffraction Curve

Fitting/Peak Decomposition.....R. C. Jones

Introduction

Convolution vs. Composition

Description of convolution in the context of XRD

Description of composition in the context of XRD

Peak-Fitting Functions

Symmetrical pseudo-Voigt, pure Gaussian, and pure

Cauchy peak functions

Split pseudo-Voigt peak function

Symmetrical and split Pearson type-VII peak functions

Pearson type-VII/pseudo-Voigt peak function

Pseudo-Voigt/modified exponential peak function

Background Options

Lorentz-polarization factor

Straight, zero-slope line background

Straight, sloping-line background

Quadratic distribution

Gaussian and Cauchy background distributions
Gaussian/modified exponential background distribution
Significance of Peak Shapes
Summary
Acknowledgments
References Cited

Quantitative Mineral Analysis by X-ray Transmission and
X-ray Diffraction.....B. L. Davis and L. R. Johnson

Introduction
Experimental Procedures
 Preliminary measurements
 Suspension and collection
 Post-loading sample preparation and measurements
Data Analysis
Selected Results
Special Analytical Problems
Summary
Acknowledgments
References cited

Quantitative Determination of Clays and Other Minerals
in Rocks.....Maynard Slaughter

Introduction
Theory
 Problem I. Mineral amounts
 Problem II. Mineral compositions
Mineral Stability
Constraints for Problems I and II
 X-ray powder diffraction intensity constraints -
 Problem I
 Non-chemical compositional constraints - Problem II
 Structural and charge-balance constraints - Problem II
 d-value constraints - Problem II
 Combined constraints - Problem II
Estimation of Quantitative Accuracy, Precision, and
 Sensitivity
Experimental Procedure
Analytical Problems and Solutions
 H₂O, CO₂, and sulfur analysis problems
 Improved H₂O and CO₂ analysis
 Clay mineral definition
Clay chemistry and Diagenesis, Gulf of Mexico Samples

Clay diagenesis
Clay chemistry
Discussion
Acknowledgments
References Cited

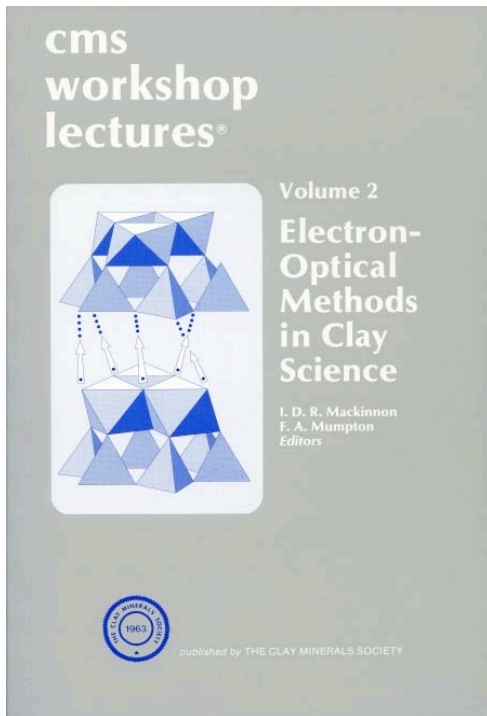
A Combined X-ray Powder Diffraction & Chemical
Method for the Quantitative Mineral Analysis of
Geologic Samples.....C. S. Calvert, D. A. Palkowsky, & D. R. Pevear

Introduction
Methods
 Sample preparation and X-ray powder diffraction
 Elemental chemical analysis
 Surface area analysis
 Other measurable properties
The Computer Program
Discussion
 Interlaboratory comparison
 Problems
 Phase identification
 Organic matter
 Polymorphs
 Mixed-layer clays
 Structural formulae
 The underdetermined system
Summary and Conclusions
Acknowledgments
References Cited

Appendix

Computer-Generated Templates to Convert Degrees 2θ to
Interplanar Spacings.....L. J. Poppe and J. E. Dodd

Introduction
Program Design
User Procedure
References Cited



VOLUME 2, 1990, Electron Optical Methods in Clay Science

I. D. R. Mackinnon & F. A. Mumpton, Editors

Introduction	I. D. R. Mackinnon
Introduction: Common Ground	
Clay Analysis	
Sample Preparation	
Dispersed grains	
Sectioned samples	
Concluding Remarks	
References Cited	
 Transmission Electron Microscopy: Scattering Processes, Conventional Microscopy, and High-Resolution Imaging.....	D. R. Veblen
Introduction	
Electron-Solid Interactions and Resulting Signals	
Elastic scattering and diffraction	
Electron diffraction	
Dynamical diffraction	
Inelastic scattering and resulting signals	
Energy-loss electrons	
Backscattered electrons	
Secondary electrons	
X-rays	

Auger electrons	
Cathodoluminescence	
Conventional TEM Imaging	
Conventional bright- and dark-field images	
Types of defects and their appearance in conventional TEM	
Contrast criteria and determination of fault vectors	
High-Resolution TEM Imaging	
Theory of HRTEM imaging	
Phase changes due to electron scattering	
Phase changes due to electron optics	
Other factors affecting high-resolution images	
Image interpretation and image simulation	
Image interpretation	
Computer image simulation	
Specimen Preparation and Beam Damage	
Specimen preparation techniques	
Damage in the electron beam	
Acknowledgments	
References Cited	

Electron Diffraction of Clay Minerals.....Necip Güven

Introduction	
Scattering of Electrons by Crystalline Solids	
Kinematical Theory of Electron Diffraction and Bragg's	
Law of Diffraction	
Interference function and the Relaxation of Bragg's	
Condition for Diffraction	
Fine Structure in Diffraction Patterns of Single Clay	
Crystallites and Other Diffraction Effects	
Diffuse streaks and extra spots	
Kikuchi lines	
Current Developments in Electron Diffraction	
Acknowledgments	
References Cited	

Selected Applications of Analytical Electron

Microscopy in Clay Mineralogy.....C. R. Hughes, C. D. Curtis, J. A. Whiteman, Sun Heping, C. K. Whittle, and B. J. Ireland	
---	--

Introduction	
Development of Analytical Methods	
Experimental Procedures	

- Basic routines
- Sample preparation
- Analytical routine
- Results and Discussion
 - “Mobile” elements
 - “k” value determination
 - Absorption problem
- Clay Minerals in the Analytical TEM
 - Glaucanite and illite
 - Sedimentary chlorites
- Summary
- Acknowledgments
- References Cited

Low Temperature Analyses in the Analytical
Electron Microscope.....I. D. R. Mackinnon

- Introduction
- Thin-Film Analysis
 - Contamination and etching
 - Radiation damage
- Low-Temperature Analysis
- Summary and Conclusions
- References Cited

Application of the Electron Microprobe and Image Analysis in the
Study of Clays.....R. E. Ferrell, Jr. and P. K. Carpenter

- Introduction
- Electron Probe Procedure
 - Apparatus
 - Specimen preparation
 - Instrument operating conditions
 - Beam damage
 - X-ray counting procedure
 - Bence-Albee quantitative calculations
 - Evaluation of results
- Typical Analytical Report
- Analytical Results
 - Analysis of points
 - Line scanning
 - Element mapping
 - Image enhancement and analysis
- Summary
- Acknowledgments
- References Cited

Case Studies, Transmission Electron Microscopy of Phyllosilicate Minerals from
Low-grade Chloritoid-bearing Rocks, North Wales.....A. J. Brearley

Introduction

Materials and Methods

Results and Discussion

Chlorite

Muscovite

Muscovite/phengite interstratification

Muscovite/paragonite interstratification

Pyrophyllite

Conclusions

Acknowledgments

References Cited

Chemical Composition and Variation of Authigenic Illite, Rotliegende Sandstone
(Permian), Southern North Sea.....E. A. Warren

Introduction

Geologic Background

Methods

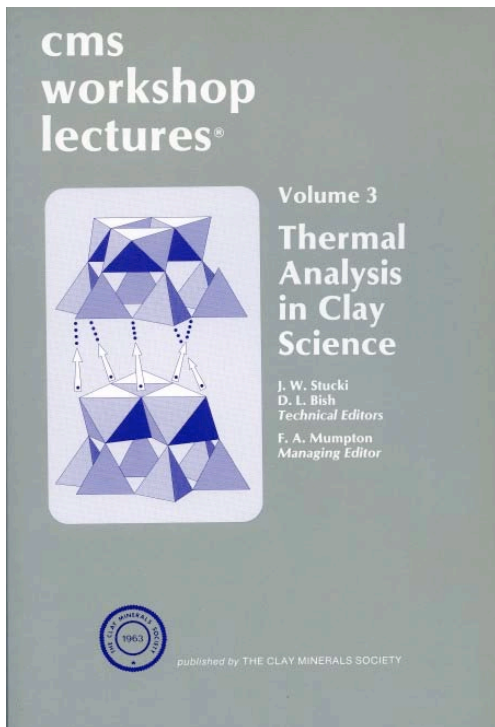
Results

Discussion

Summary and Conclusions

Acknowledgments

References Cited



Volume 3, 1990, Thermal Analysis in Clay Science

J. W. Stucki, D. L. Bish, & F. A. Mumpton, Editors

Introduction.....	R. F. Giese, Jr.
Precision Scanning Calorimetry of Clay Minerals and their Intercalates.....	R. F. Giese, Jr.
Introduction	
Theory of Decomposition of Solids	
Decomposition events	
Clay mineral intercalates	
Experimental Methods	
Thermogravimetric analysis	
Differential scanning calorimetry	
Measurements	
Sample preparation and operation	
Sub-ambient operation	
Kinetics of Deintercalation	
General	
Inhomogeneous rate laws	
Contracting circle	
Avrami-Erofeev law	
Differential scanning calorimetry	
Activation energy	
Determining the rate law	
Examples: Deintercalation	

- Experimental conditions
- Computations
- Heat Capacity Measurements
- Examples: Heat Capacity
 - Single material
 - Experimental conditions
 - Computations
 - Intercalated material
 - Experimental conditions
 - Computations
- Discussion
 - Deintercalation of N-methyl formamide
 - Samples
 - Deintercalation results
 - Heat capacity of water intercalated in kaolinite
- Summary
- References Cited

High-Pressure Differential Thermal Analysis: Applications to
Clay Minerals.....A. F. Koster van Groos and Stephen Guggenheim

- Introduction
- Experimental method
 - Apparatus
 - Sample preparation and characterization
 - Differential thermal analysis
 - Additional experimental considerations
- Discussion
 - Structural aspects of phyllosilicates
 - Dehydration reactions in montmorillonite
 - Interpretation of HP-DTA data
 - Results
 - Physical model
 - Application to geologic systems
 - Dehydroxylation reactions (dioctahedral Al-rich phases)
 - Physical model for dehydroxylation in 2:1 layers
 - Interpretation of HP-DTA data
 - Results and discussion - kaolinite
 - Results and discussion - montmorillonite
- Future of High-Pressure Differential Thermal Analysis
- Acknowledgments
- References Cited

Thermogravimetric Analysis of Minerals.....D. L. Bish and C. J. Duffy

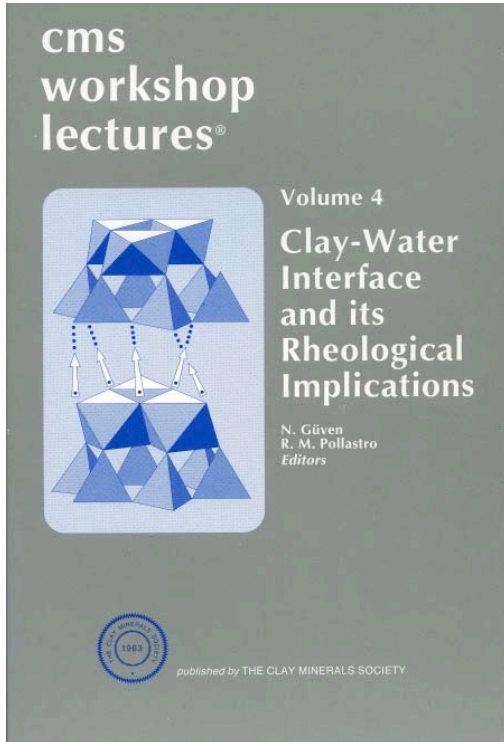
- Introduction
- Experimental
- Fundamentals of Thermogravimetric Analysis
 - Characteristics of mass-loss curves
 - Derivative thermogravimetric analysis
 - Source of mass loss and gain
- Factors Affecting Thermogravimetric Results
 - Thermal reactions on a molecular scale
 - Factors affecting thermogravimetric experiments
- Effects of Mineral Composition on Thermal Reactions
- Treatment of Thermogravimetric Data
 - Structural formulae
 - Analysis for non-water volatiles
 - Quantitative analysis of mixtures using TGA data
- Advanced Treatment of TGA Data
 - Determination of reaction kinetics from TGA data
 - Nonisothermal reaction kinetics
 - Isothermal reaction kinetics
 - Modeling dehydration processes in minerals
- Summary and Conclusions
- Acknowledgments
- References Cited

Vacuum Thermogravimetric Analysis and Evolved Gas Analysis
by Mass Spectroscopy.....F. J. Wicks and R. A. Ramik

- Introduction
- Instrumentation
 - Thermal balance
 - Mass spectrometer
 - Vacuum system
 - The Royal Ontario Museum system
- Methodology
 - Sample preparation
 - Sample storage
 - Sample weighing
 - Vacuum thermogravimetric analysis
 - Evolved gas analysis
- Interpretation
- Summary
 - Advantages of the vacuum method
 - Disadvantages of the vacuum method

Conclusions
Acknowledgments
References Cited

Mineral IndexJ. W. Stucki



Volume 4, 1992, Clay-Water Interface and its Rheological Implications

Edited by N. Güven & R. M. Pollastro

Molecular Aspects of Clay/Water Interactions.....Necip Güven

Introduction

Colloidal Characteristics of Clay Particles

Morphology of clay particles

Electrically charged surfaces of clay particles

Edge surfaces and their electrical potentials

Structure and Dynamics of the Water Molecule

Electrostatic rigid model

Dynamics of the water molecule

Other models for the structure of the water molecule

Hydration of Ions

Hydration of ions in the gas phase

Hydration of ions in liquid water

Structure of hydration complexes of ions in liquid water

Dynamics of the hydration complexes in liquid water

Hydration of Clays

Interlamellar hydration of clays in the vapor phase

Dynamics of interlamellar hydrates

Interlamellar hydration of clays in liquid water

Capillary condensation of water in clays

- Clay-Water Interface: Electrical Double Layer
 - Shortcomings of the diffuse double layer model
 - Refinements of the diffuse double layer model
 - A hypothetical double layer model
- Interparticle Forces in Clay Suspensions
 - Brownian motion and diffusion
 - Double-layer repulsion
 - van der Waals attraction
 - Born repulsion
 - Hydration forces
 - Undulation forces
 - “Attractive” interlayer forces leading to the quasi-crystal formation by multivalent cations
 - Steric and entropic repulsions
- DLVO Theory on the Stability of Colloidal Dispersions
 - DLVO interaction potential
 - Success and failure of DLVO theory
- Current Trends: Computer Simulation Experiments
 - Full interaction matrix
 - Computer simulation of clay-water interface
- Acknowledgments
- References Cited

Rheological Aspects of Aqueous Smectite Suspensions.....Necip Güven

- Introduction
- Viscosity and Flow Behavior
 - Newtonian flow
 - Non-Newtonian flow
- The Generalized Viscosity Equation
 - Viscosity of real suspensions
 - Particle concentration
- Particle Characteristics and Intrinsic Viscosities
 - Particle morphology
 - Particle size and distribution
 - Particle surface area
 - Particle hydration
- Forces Affecting the Rheology of a Colloidal Suspension
 - Brownian motion
 - Hydrodynamic forces
- Repulsive Interparticle Forces and the Suspension Rheology
 - Primary electroviscous effect
 - Secondary electroviscous effect
- Attractive Interparticle Forces and the Suspension Rheology

- Rate of flocculation
- Effects of pH and electrolytes on smectite flocculation
- Critical flocculation concentrations of the common electrolytes
- Effects of flocs on the suspension rheology
- Gelation and thixotropy
- Intrinsic Viscosities of Clay Minerals
- Rheology of Smectite Suspension: General Picture
 - Structure and dynamics of a smectite suspension
 - Flow behavior of smectite suspension
- Smectite Suspensions at High Temperatures
 - Viscosity anomalies at high temperatures
 - Smectite suspensions and liquid crystals
- Acknowledgments
- References Cited

The Diffuse-Ion Swarm near Smectite Particles
Suspended in 1:1 Electrolyte Solutions: Modified Gouy-Chapman Theory
and Quasicrystal Formation.....Garrison Sposito

- Introduction
- Quasicrystals of Smectite-Containing Monovalent Adsorbed Cations
 - Smectite quasicrystals
 - Indirect evidence: Viscosity and light scattering
 - Direct evidence: Neutron scattering
- Monovalent Ion Swarms Near Smectite Surfaces
 - Modified Gouy-Chapman theory
 - Surface complexation models
 - The accuracy of MGC theory
- Modified Gouy-Chapman Theory of the Electrical Double Layer
on Montmorillonite Containing Monovalent Adsorbed Cations
 - Inner potentials
 - Counterion condensation
- Quasicrystal Effects on the Diffuse-Ion Swarm
 - Interparticle spacing
 - Coion exclusion
- Summary
- Acknowledgments
- References Cited

Interparticle Forces in Clay Suspensions: Flocculation,
Viscous Flow, and Swelling.....Philip F. Low

- Introduction
- Flocculation

Viscous Flow
Swelling
 Effects of surface hydration
 Effects of double-layer repulsion
Summary
References Cited

Particle Associations in Clay Suspensions and their
Rheological Implications.....H. van Olphen

 Introduction
 Stability of Clay Suspensions
 Particle Associations and Rheological Properties of Clay Suspensions
 Observations in dilute suspensions
 Observations in concentrated suspensions
 Interpretation of the rheological behavior
 Deflocculation and rheological properties
 Rheological Properties of Sediments
 Sedimentation and colloidal stability
 Soil mechanics
 Technological Applications
 Treatment of clay-water base drilling fluids
 Slip casting in ceramics
 Paper coatings
 Viscometry
 Quantitative Evaluation of Particle Associations from Rheological Data
 Evaluation of the EF linking force from Bingham flow for pure
 Na- montmorillonite gels
 Evaluation of the energy barrier for particle linking from
 thixotropic recovery rates in salt containing gels
 Summary
 References Cited

Characteristics and Mechanisms of Clay Creep and 211 Creep
Rupture.....J. K. Mitchell

 Introduction
 General Characteristics
 Creep as a Rate Process
 Bonding, Effective Stresses, and Strength
 Deformation parameters from creep test data
 Activation energies for creep
 Number of interparticle bonds
 Significance of activation energy and bond number values

Time Dependency of Creep Rate

Constitutive Models

Rheological models

A general stress-strain-time function

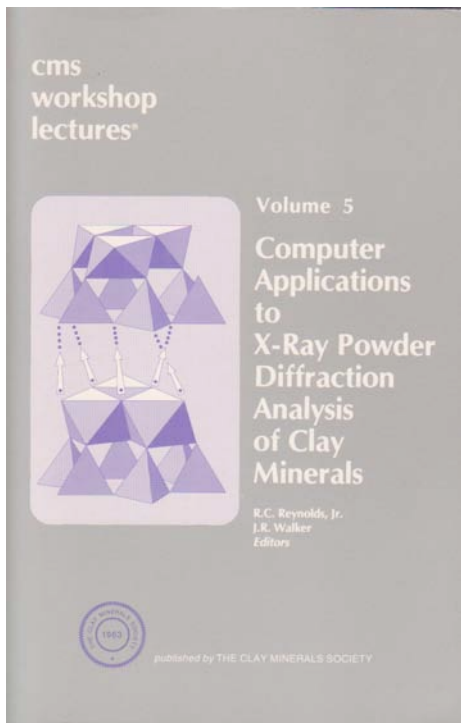
Creep rupture

Limitations

Summary and Conclusions

Acknowledgment

References Cited



Volume 5, 1993, Computer Applications to X-Ray Powder Diffraction Analysis of Clay Minerals

R. C. Reynolds, Jr & J. R. Walker, Editors

An Introduction to Computer Modeling of X-ray Diffraction Patterns of Clay Minerals: A Guided Tour of NEWMOD©.....J. R Walker

Introduction

Basic Intensity Calculation

The Layer Structure Factor

The Lorentz-Polarization Factor

The Interference Function

The Frequency Factor

The Complete Intensity Equation

Additional Considerations

Peak Shape Modeling

Particle-Size Versus Defect Broadening

Mixed-Layer Broadening

Modeling Phases Not Included In NEWMOD©

Concluding Remarks

Acknowledgments

References Cited

Inverting the NEWMOD© X-ray Diffraction Forward Model for Clay Minerals Using Genetic Algorithms.....D. R. Pevear and J. F. Schuette

- Introduction
- Genetic Algorithms
 - Overview
 - Genetic Algorithms 101
 - Pop Example
 - Step one: design a chromosome
 - Step two: build and evaluate a starting population
 - Step three: build the next generation and continue evolving
 - Genetic Algorithms 201
 - Contrasted to Other Techniques
 - MatchMod Revealed
- Implementation Of MatchMod
- Tour Of MatchMod with discussion
 - Choice of Manipulated Parameters: Input Dialog Boxes
 - The main dialog: mixed-layer phase
 - The discrete phase dialog
 - Choice of manipulated parameters
 - A MatchMod Run: The Run Window
 - Fitness Evaluation
- Examples With Discussion
 - Cretaceous Shale
 - Coarse clay fraction
 - Medium clay fraction
 - Fine clay fraction
 - The Illite 001 Problem
- Discussion And Conclusions
 - Factors affecting fit
 - Phase not in MatchMod
 - Multiple phases of the same broad mineral group
 - Simplistic mineral descriptions in the model
 - Instrument and sample parameters (site settings) incorrect
 - Quantitative analysis
 - Future Directions
- Acknowledgements
- References Cited

Three-dimensional X-ray Powder Diffraction from Disordered Illite:
 Simulation and Interpretation of the
 Diffraction Patterns.....R. C. Reynolds, Jr.

- Introduction
 - Calculation of Three-Dimensional Powder X-ray Diffraction Patterns

Mixed-Layered flhite/Smectite	
Layer Types	
Experimental	
Powder X-Ray Diffraction By Ordered Crystals	
The Intensity in One Dimension	
Diffracted Intensity in Three Dimensions	
Transformation to Orthogonal Reciprocal Space	
The Orthogonal Reciprocal Lattice	
X-Ray Powder Diffraction By Disordered Crystals	
Turbostratic Disorder	
Disorder Caused by $n.60$ or $n. 120$ Degree Rotations of 2:1 Layers	
Overall Diffraction Equation for Rotationally Disordered Micas--a	
Summary	
Treatment of I/S	
Calculated Patterns	
Input Model Parameters	
Interpretation Of Diffraction Patterns	
General Principles	
C_v and T_v 1M Structures	
Disordered C_v Structures	
Disordered T_v Structures	
Interstratified C_v and T_v Structures	
Turbostratic Disorder--the Effects of Very Thin Crystallites	
$n.60^\circ$ Disorder	
Comparisons Between Calculated And Experimental Diffraction Patterns	
I/S with Low Expandability	
I/S with Intermediate Expandability	
I/S with High Expandability	
Comments	
Acknowledgements	
References Cited	

Studies of Clays and Clay Minerals Using X-ray Powder Diffraction
and the Rietveld Method.....D. L. Bish

Introduction	
The Rietveld Method	
Starting Models for Refinement	
Transmission electron microscopy	
Distance least-squares modeling	
Electrostatic energy minimization	
Disorder In Clays And Clay Minerals	
Effects of Disorder on Diffraction Patterns	
Applications Of The Rietveld Method To Clay Minerals	
Crystal Structure Refinements	

- Dickite
- Kaolinite
- Chlorite
- Partial Structure Solution
 - Hydrogen Atoms in Kaolinite
 - Hydrogen Atoms in Dickite
 - Interlayer Structure of Kaolinite Intercalates
 - Exchangeable Cations and Water in Sepiolite
- Quantitative Analysis
 - Theory
 - Application
- Refinement of Unit-Cell Parameters
- Analysis of Peak Broadening
 - Goethite
- Sample Refinement
 - Sample Preparation and Data Collection
 - Refinement Strategies
- Conclusions
- Acknowledgments
- References Cited

Illite Crystallite Thickness by X-ray Diffraction.....D. D. Eberl and A. Blum

- Introduction
- Factors *That* Affect XRD Peak Broadening
- Two XRD Methods For Measuring Crystallite Thickness
 - Scherrer Method
 - Warren-Averbach Method
- Three Other Methods For Measuring Illite Crystal Thickness
 - Analysis By TEM
 - Analysis By SFM
 - Analysis By Fixed Cation Content
- Comparisons Between XRD Methods And Other Methods
 - Comparisons Between Mean Particle Thickness Measurements
 - Comparisons Between Thickness Distribution Measurements
- Calculation Of Illite Properties
 - Calculation Of Crystal Size Distribution From Mean Size
 - Calculation Of Other Properties For Illite
- Expandability And The Kubler Index
- Summary And Conclusions
- Acknowledgments
- References Cited
- Appendix: The Warren-Averbach Method

A Computer Technique for Rapid Decomposition of
X-ray Diffraction Instrumental Aberrations from
Mineral Line Profiles.....R. C. Jones and H. U. Malik

Introduction

Symmetrical And Split Pseudo-Voigt Functions

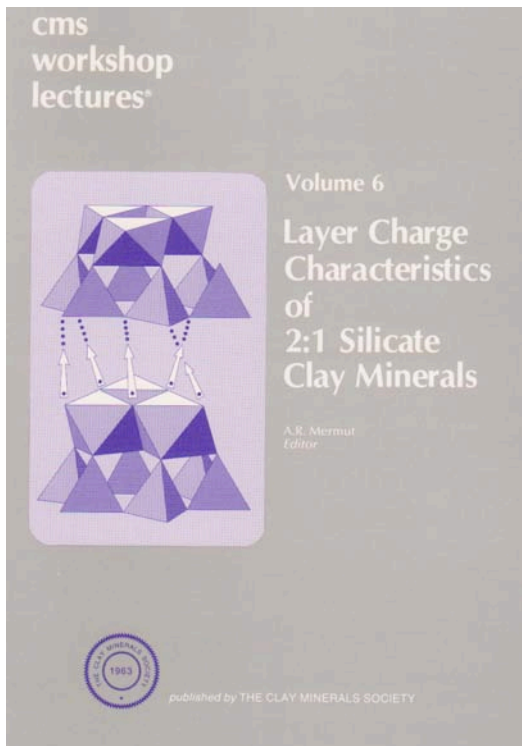
Method Of Minimization

Methods And Materials

Curve Fitting Examples

Conclusions

References Cited



Volume 6, 1994, Layer Charge Characteristics of 2:1 Silicate Clay Minerals

A. R. Mermut, Editor

Layer Charge Determination by Alkylammonium Ions.....	G. Lagaly
Introduction	
Materials and Methods	
Results	
Interlamellar Arrangement of Alkylammonium Ions	
Layer Charge Determination	
Smectites	
Corrections	
Vermiculites	
Micas	
Mixed-Layer Minerals	
Applications	
Identification of Smectites and Vermiculites	
High Performance Characterization of Smectites and Vermiculites	
Montmorillonite Content of Bentonites	
Cations at the Edges	
HRTEM Techniques	
Summary	
References Cited	
Role of Layer Charge in Organic Contaminant Sorption by Organo-Clays.....	S.A. Boyd and W.F. Jaynes

- Introduction
- Organophilic Clays
- Adsorptive Clays
- Role of Layer Charge
 - Organophilic Clays
 - Adsorptive Clays
- Acknowledgements
- References Cited

Evaluation of Structural Formula and Alkylammonium
Methods of Determining Layer Charge.....D.A. Laird

- Introduction
- The Structural Formula Method
 - Structural Formula Calculations
 - Layer Charge Estimates From Structural Formulae
 - Sample Contamination Effects
- Alkylammonium Method
 - Layer Charge Calculations
 - Layer Charge Heterogeneity - Traditional Interpretation
 - Layer Charge Heterogeneity - Alternative Interpretation
 - The Particle Size Effect
 - Identification of Vermiculite
- Comparison Of Layer Charge Values Determined By The Structural
Formula And Alkylammonium Methods
- Summary
- References Cited

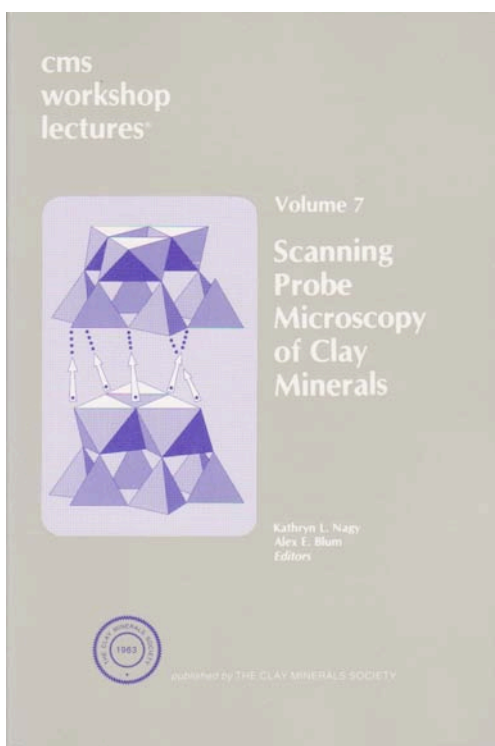
Problems Associated with Layer Charge Characterization
of 2:1 Phyllosilicates.....A.R. Mermut

- Introduction
- Determination of Layer Charge in High Charge Phyllosilicates
- Charge Distribution Between Tetrahedral and Octahedral Sheet by
Li-Saturation
- Calculation of the Average Charge by Nitrogen Determination
- Correction of the Peak Positions of Alkylammonium Saturated Clays
- References Cited

The Movement of Neutral Particles in Charged MediaJ. Farmer

- Introduction
- Particulate Generation and Removal Processes
 - Particle Generation
 - Particle Removal
- Multicomponent Aqueous Phase
- Chemistry of Carrier Mechanism

Competitive Interactions of Solutes and Montmorillonite
Retention of Ethylene Dibromide by Clay Minerals
References Cited



Volume 7, 1994, Scanning Probe Microscopy of Clay Minerals

Kathryn L. Nagy & Alex E. Blum. Editor

High Resolution Scanning Probe Microscopy: Tip-Surface Interaction, Artifacts, and Applications in Mineralogy and Geochemistry.....C. Eggleston

INTRODUCTION

What is SPM?

Terminology

The Need to Understand Tip-Surface Interaction

SCANNING TUNNELING MICROSCOPY (STM)

Basic Principles

STM in Practice

Feedback Control

Tips

Leakage currents

Calibration

Particles

ATOMIC FORCE MICROSCOPY (AFM)

Basic Principles

- Forces Normal to Surface
- Frictional Forces
- Magnetic forces
- AFM in Practice
 - Tips
 - Tip and Sample Wear
 - Deformation
 - Multiple-tip contact
 - Friction effects
 - Filters
 - Force Calibration and Minimization
 - Particles
 - Fluid Cell

COMMON Artifacts IN SPM

- Multiple Tips, Rough Surfaces, and the Importance of Flat Samples
 - Multiple Tips and Microtopography
 - Microtopographically Rough Surfaces
 - Multiple Tips at the Atomic Scale
 - Changes in Resolving Ability or Position of the Tip.
- Variable Tunneling Barrier (STM)
- Variable Tip Shape
- Time Resolution
- Feedback Oscillations, Resonance, and Shadowing
- Vibrational Noise
- Drift
- Friction Effects and Sample Erosion
- Image Processing

EXAMPLES: SPM IMAGING AND IMAGE INTERPRETATION

- STM
 - Pyrite
- AFM
 - Albite
 - Calcite
 - Concluding comments

BRIEF REVIEW OF SPM APPLICATION IN GEOSCIENCE

- Surface Microtopography
 - Crystal Dissolution and Growth
 - Friction
 - Diatoms
 - Clays
- High-Resolution Imaging
 - Surface Structure

Structure and Dynamics of Adsorbates
Local Electronic Structure
Redox Reactions
Magnetic Structure

NON-IMAGING APPLICATIONS OF SPN

Electron Tunneling Spectroscopy
Force-Distance Measurements

SUMMARY

ACKNOWLEDGMENTS

REFERENCES CITED

Atomic and Molecular Scale Imaging of Layered and
Other Mineral Structures.....F. Wicks, G. Henderson, and G. Vrdoljak

INTRODUCTION

EXPERIMENTAL TECHNIQUES

General Procedures for Image Acquisition and Filtering
Filtering Routines
Plane Fit/Flattening
Lowpass/Highpass
2-Dimensional Fast Fourier Transforms (2DFFT)

Resolution
Cantilever Force
Specific Operating Procedures

AFM IMAGES OF 1:1 LAYER PHYLLOSILICATES

Lizardite and Kaolinite

AFM IMAGES OF 2:1 LAYER PHYLLOSILICATES

Muscovite
Illite and Smectite
Clinochlore

AFM IMAGES OF Other Minerals

Albite
Astrophyllite
Calcite
Gypsum
Hematite
Uranium Phosphates
Zeolites and Zeolite-Like Materials
Glasses

MINERAL-WATER INTERFACE AND CATION ADSORPTION

Apophyllite
Cesium Adsorption on Clinocllore

SUMMARY AND CONCLUSIONS
ACKNOWLEDGEMENTS
REFERENCES Cited

Mineral-Water Interactions: Fluid Cell Applications of
Scanning Force Microscopy.....P. Dove and J. Chermak

INTRODUCTION
THE SFM FLUID CELL
 Designs
 Usage
 Sample preparation
 Sample mounting
 Filling the Fluid Cell
 Temperature Control
 Imaging
 Reactor Simulation
 Compatible Real Time Reaction Rates
INVESTIGATIONS OF MINERAL-WATER REACTIONS BY FLUID
CELL SFM
 Dissolution
 Precipitation and Growth
 Nucleation
 Monolayer and spiral growth
 Effect of Sorbed Ions and Organic Molecules
 Surface Precipitation
FUTURE APPLICATIONS TO CLAY MINERAL-WATER
INTERACTIONS
 Chemical Perturbations in Engineered Earth Systems
 Weathering Reactions
 Mineral Transformations
CONCLUSIONS
ACKNOWLEDGMENTS
REFERENCES CITED

Determination of Illite/Smectite Particle Morphology Using Scanning Force
Microscopy.....A. Blum

INTRODUCTION
SAMPLE PREPARATION AND MOUNTING
 Sample Treatment and Dispersion

- Chemical Treatments
- Ultrasonic Dispersion
- Suspension Concentration
- Sample Mounting
 - The Muscovite Mounting Surface
 - Evaporation of the Sample
 - Reaction of the Muscovite Substrate
- Dissolution of the Muscovite {001} Surface
- PARTICLE THICKNESS MEASUREMENTS
 - Collecting and Processing SFM images for Height Measurements
 - Anatomy of an SFM image
 - Real Time Image Processing
 - Post-Processing of Images
 - Deflection Images Collected in Height Mode
 - The Muscovite Unit Cell Step - Limits on the Resolution of Height Measurements
 - Effects of Tip Shape on SFM Images
 - Resolution of Features $>\sim 30\text{nm}$
 - Resolution of Features $<\sim 30\text{nm}$
- PARTICLE THICKNESS DISTRIBUTIONS
 - Methods
 - Height (z) Calibration of the Piezoelectrode
 - Comparison of SFM Clay Thickness Measurements with other Techniques
 - Measurement of Unit Cell Heights
 - Particle Size Distributions
 - Mean Particle Thicknesses
- SURFACE MORPHOLOGY OF FUNDAMENTAL ILLITE PARTICLES
 - Steps on the Illite Surface
 - Implications of Surface Steps for the Smectite-to-Illite Transition
- INTERPARTICLE FORCES AND THE MECHANICAL BEHAVIOR OF ILLITE AGGREGATES
- CONCLUSIONS
- ACKNOWLEDGEMENTS
- REFERENCES CITED

Application of Morphological Data Obtained Using Scanning Force Microscopy to Quantification of Fibrous Illite Growth Rates.....K. Nagy

- INTRODUCTION
- DIAGENETIC FIBROUS ILLITE
- METHODS
 - Fibrous Illite Samples
 - Sample Preparation and SFM Analysis
 - Rate-Law Derivation

RESULTS

SFM Observations

Correlation of Mean Particle Dimensions with Geologic Parameters

Depth

Maximum temperature

Clay mass

Reaction Rate Law

DISCUSSION

Potential Inaccuracies in Particle Dimension Measurements

Effect of sonication

Effect of dissolution during sample preparation and storage

SFM imaging artifacts

Imaging difficulties due to sample characteristics

Anomalous Sample Results

Reaction Rate Laws

Diffusion-controlled reactions

Surface-reaction controlled

Nucleation sites and activation energy barriers

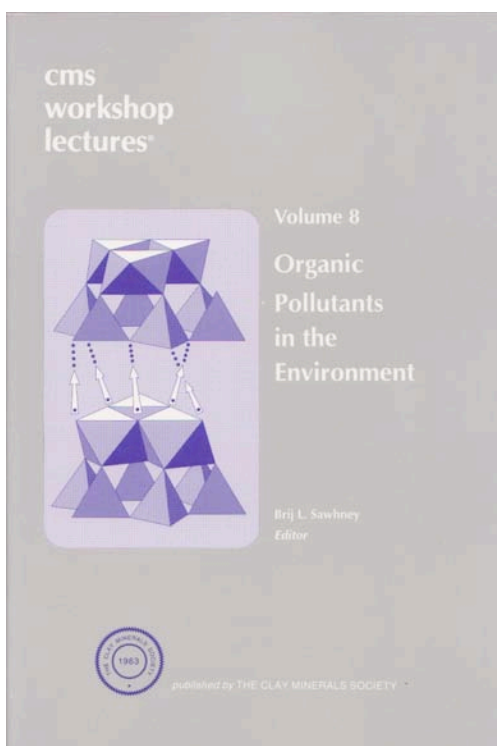
Ostwald ripening

Relationship of dimension growth rates to mass growth rates

SUMMARY

ACKNOWLEDGMENTS

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Introduction

Active Sites On Clay Minerals

Site #1: Neutral Siloxane Surface

Site #2 Isomorphic Substitution Sites

Site #3 Exchangeable Metal Cations and Exposed Undercoordinated Metal Atoms

Site #4 Polarized water molecules surrounding exchangeable cations

Site #5 Hydrophobic Sites

Site #6 Broken Edge Sites

Natural Clay Surfaces

Adsorption Behavior of Organic Molecules On Clay Surfaces

Organic Cations

Representative Organic Cations

Active Sorption Sites on Clay Surfaces

Sorption Mechanisms

Organic Cation Sorption in Excess of the Cation Exchange Capacity (CEC)

Hydrophobic Modification of Clay Surfaces

Bioavailability

Use of Organic Cations as Molecular Probes

Organic Bases

Representative Organic Cations

Active Sorption Sites on Clay Surfaces

Sorption Behavior / Mechanisms

Surface Acidity Related to Sorption of Organic Bases

Molecular Probe Studies of Clay Surfaces Using Organic Bases.

Chemisorption of Organic Bases

Non Polar Organic Solutes

Representative Non Polar Organic Compounds

Active Sorption Sites on Clay Surfaces

Vapor-phase VOC Sorption Mechanisms

BET and Competitive BET Model

Spectroscopic Sorption Isotherm

Sorption from the Aqueous Phase

Sorption on Modified Surfaces

Organic Acids

Representative Organic Acids

Active Sorption Sites on Clay Surfaces

Sorption of Organic Acids

Summary

References Cited

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Introduction

Vapor-Phase Sorption/Desorption

Sorption Isotherms

Sorption Hysteresis

Sorption/Desorption Kinetics

Effect of Moisture on Vapor-phase Sorption/Desorption

Desorption from Moist Systems

Hydrophobicity Of Clay Surfaces

Aqueous-Phase Sorption/Desorption

Sorption Isotherms

Slow Sorption/Desorption

Laboratory Experiments
Field Observations
Mechanisms for Slow Sorption/Desorption

Summary
References Cited

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Contaminants from Water.....F. Cadena and E. Cazares

Introduction
Natural Zeolites
Organic Modification of Natural Zeolites

Materials And Methods
General Procedures and Materials
Determination of External Cation Exchange Capacity (ECEC)
Organic Modification of the Zeolitic Tuffs
Organozeolite Regeneration Tests
Grain Size Studies
Isotherm Development

Results
Characteristics of the Zeolitic Tuffs
Sorpitive Properties of Untreated Zeolitic Tuffs and Organozeolites

Discussion
BTX Removal by Zeolitic Tuffs Modified with TMA⁺
BTX Removal by Zeolitic Tuffs Modified with
Long-Alkylammomum Chains
Regeneration of TMA-Treated Zeolites

Conclusions
Recommendations
Acknowledgments
References Cited

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Slurry Walls.....R. W. Gullick, W. J. Weber, and D. H. Gray

Introduction
Landfill Barriers

Clay Liners
Soil-Bentonite Slurry Walls
Characteristics of Bentonite Clay

Organic Contaminants and Their Migration In Saturated Soils
Advective Transport
Diffusive Transport
 Diffusion Through Porous Media
Relative Contributions of Diffusion, Advection, and Dispersion to
 Contaminant Transport
Sorption by Soil Materials
Laboratory Studies of Diffusive Transport Through Porous Media
Field Studies of Diffusive Transport Through Porous Media

Effects of Leachate Composition on the Hydraulic Conductivity and
Integrity of Barriers
 Interactions of Inorganic Chemicals with Clays
 Interactions of Organic Chemicals with Clays
 Effects of Experimental Procedures on Measured Values of
 Hydraulic Conductivity
 Effects of Leachates on the Hydraulic Conductivity of Clay
 Barriers
 Practical Implications of Leachate Effects on the Hydraulic
 Conductivity of Clay Barriers

Addition of Sorbents to Landfill Barriers
 Potential Sorbents for Inclusion in Landfill Barriers
 Activated Carbon
 Fly Ash
 Modified Clays
 Natural Soil Materials
 Summary of Potential Sorbents
 Effects of Sorbent Addition on Organic Contaminant Transport
 Through Landfill Barriers

Summary
Acknowledgements
Symbols Used
References Cited

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Removal Rates and Extents.....J. W. Blackburn

Introduction

Prior Reviews

To What Extent Does Substrate Sorb Or Partition With Soil?

Experiments On Substrate Sorption-Desorption With Whole Soil

Experiments On Substrate Sorption-Desorption On Soil Organic Matter

Experiments On Substrate Sorption-Desorption With Contaminant Organic Carbon

Experiments On Substrate Sorption-Desorption With Clay Minerals

Experiments On Substrate Sorption-Desorption With Biomass

Experiments On Substrate Sorption-Desorption With Sand

Dissolution Of Solid Substrate In Soil System

To What Extent Does Biomass Sorb/Partition With Soil?

Are Soluble Substrates Required For Biodegradation?

What Are The Effects Of Nonequilibrium Sorption-Desorption Behavior On Biodegradation?

Does Formation Of Soil-Bound Residues Decrease Bioavailability?

Summary

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Measuring Techniques

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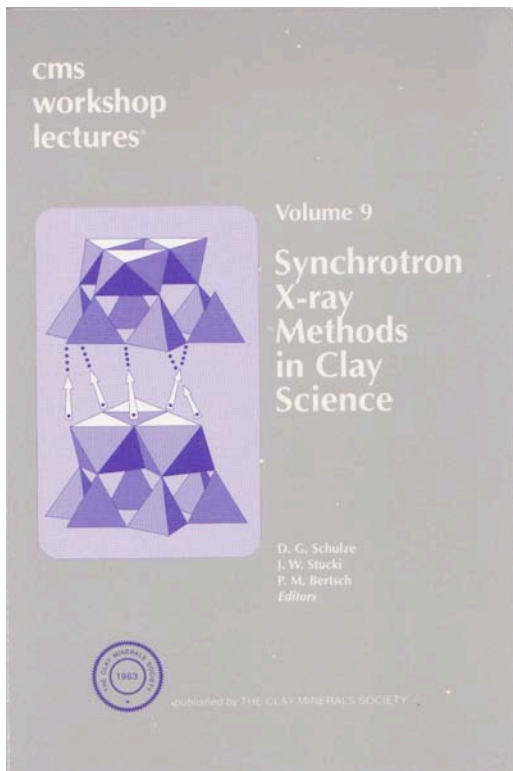
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Polarity of the Mineral Surface

Fluorescence Quenching.

Conclusions

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- Synchrotron X-ray Sources and Synchrotron Light
- General Description of a Synchrotron
 - First, Second, and Third Generation Synchrotron X-ray Sources
- Properties of Synchrotron Radiation
 - X-ray Generation
 - Energy versus Wavelength
 - Definitions of X-ray Intensity
 - Energy Distribution of Bending Magnets
 - Energy Distribution of Insertion Devices
 - Polarization and Time Structure
- Hard versus Soft X-ray Synchrotrons
- Summary
- References

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Introduction

- XAFS Applications in Clay and Soil Science
- Basic Consequences of X-ray Absorption
- XAFS Data Acquisition and Analysis
 - Experimental Considerations
 - Conventional Experimental Designs
 - Obtaining Surface Sensitivity
 - Electronic, Symmetry, and Chemical Environment
 - Determination:
 - XANES Spectroscopy
- Structural Analysis: EXAFS Spectroscopy
 - Analysis Steps
 - Data Analysis Programs
- Sources of Further Information
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 - Overlap of Atomic Shell Contributions
 - Differentiation Between Dioctahedral and Trioctahedral Frameworks
- Principles of P-EXAFS
- Methodology
 - Obtaining the Out-of-plane EXAFS Spectrum
 - Texture of Self-supporting Films
- Applications
 - Dioctahedral Clay Structures
 - Trioctahedral Clay Structures
 - Phyllophanates
 - CoOOH
- Conclusions
- Acknowledgments
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Introduction

- Single Crystal Experiments
 - Diffraction From Microcrystals
 - Diffraction From Mineral Interfaces

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Instrument Geometry
New Detector Technologies
Resonant Scattering
Micro-Powder Diffraction
Time-Resolved Studies
Conclusions and Future Prospects
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Hard X-ray Microprobe Techniques
Microanalysis Using the X-ray Fluorescence Technique
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Microtomography
Applications
New Opportunities Using X-ray Microprobes at Third Generation Synchrotron Sources
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Identification of Mineral Phases in Multiphase Assemblages
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Other Microspectroscopic Applications
Future Prospects
Acknowledgements
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Elemental Analysis
Differential Edge Contrast in Transmission Edge Contrast using Fluorescence

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 Spectromicroscopy
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Potential for Clay and Mineral Studies
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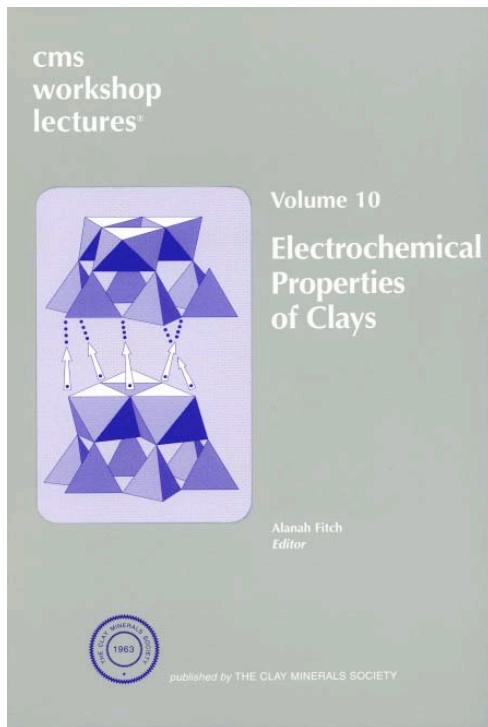
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Introduction
The X-ray Microscope at BFSSY
X-ray Microscopy of Clay Suspensions
Summary
Acknowledgements
References

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Introduction
Experimental Methods and Procedures
 Hydrothermal Diamond Anvil Cell (HDAC) Cornell High Energy
 Synchrotron Source (CHESS)
Results
 Ca-montmorillonite
 Mg-montmorillonite
Discussion
 Dehydration
 Pressure Dependence of Rehydration Hysteresis
 Effect of Interlayer Cations
Conclusions
Acknowledgments
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INTRODUCTION

NON-FARADAIC PROCESSES

The Passive Electrified Interface

Transport Mechanisms in Charged Matrices

Electroosmosis

Electromigration and Conductivities

Electrochemical Remediation of Metal Contaminated Soils

FARADAIC PROCESSES

Electron Transfer Reactions

Gradients Set Up by Electron Transfer Reactions

The Cyclic Voltammogram (CV)

Electrochemistry in Colloidal Suspensions

CV Experiments at a Clay-Modified Electrode (CME)

CME CV as a Miniature Chromatographic Column

Direct Determination of D by Varying the Scan Rate

Ratio Currents

CME CV Examples
Pore Volume Samplers: Anionic Probes
CME CV of DDL Cations
Complex Kinetic Applications
Future Applications to Halogenated Organics
in Soil Matrices
Non-Diffuse Double Layer Compounds

DIRECT ELECTROCHEMISTRY OF CLAY TRANSITION METAL
SITES
LABORATORY PRACTICES
SUMMARY
REFERENCES

Application of Langmuir-Blodgett Method for Preparing a
Clay-Modified Electrode.....Aki Yamagishi

INTRODUCTION
A MONOLAYER OF A HYDROPHOBIC CLAY

Preparation of a LB film of a clay ion-exchanged
with alkyl ammonium
AFM observation of a deposited LB film
X-ray diffraction of a clay film prepared by the
Langmuir-Blodgett method
Electrochemical measurements on an electrode modified with a LB
film of a clay
A proposed structure of a LB film of a clay

A HYBRID MONOLAYER OF A CLAY AND A METAL COMPLEX

Preparation of a clay LB film using a cationic monolayer as a
template
Observation with a Brewster angle microscope
Multilayer properties as studied with various spectroscopic
methods
Surface structures of a clay film as observed with AFM

CONCLUSIONS
ACKNOWLEDGEMENTS
REFERENCES

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Environmental Applications.....James E. Amonette

INTRODUCTION

- Iron associated with minerals
- Iron as a reductant

REDOX CHEMISTRY OF IRON

- Electronic structure
- Thermodynamics
 - Reduction potentials from free-energy data
 - Reduction potentials from electronic structures
 - Solid-phase reduction potentials

ENVIRONMENTAL APPLICATIONS

- Kinetics
- Environmental contaminants
 - Chlorinated hydrocarbons
 - Nitroaromatics
 - Inorganic species
 - Redox mediators and buffers
- Natural attenuation processes
- In-situ redox manipulation
 - Dithionite barrier concept and chemistry
 - Reduction of Cr(VI)
 - Reduction of chlorinated compounds
 - Reduction of nitroaromatic compounds
- Iron as an oxidant
 - Oxidative polymerization of aminoaromatic compounds
 - Humic substance formation
 - As(III) oxidation and sorption

ACKNOWLEDGMENTS

REFERENCES

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INTRODUCTION

- Electrode modifications with natural clays
- Electron transfer between iron sites in the clay lattices and species adsorbed in CMEs

ELECTRODE MODIFICATION WITH SYNTHETIC CLAYS.

Introduction

Preparation of synthetic transition metal smectites

Electrochemistry of the synthetic Fe-smectites

Electrochemistry of the synthetic Co-smectites

Electrochemistry of the synthetic copper clays

ELECTRODE MODIFICATION WITH LAYERED
DOUBLE HYDROXIDES

Preparation of layered double hydroxides

Electrochemistry of LDH films in blank electrolyte solutions

LDH-modified electrodes containing electroactive ions

CONCLUSIONS

ACKNOWLEDGMENTS

REFERENCES

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Electrolytes.....Evangelos Manias, Athanassios Z. Panagiotopoulos,

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INTRODUCTION

EXPERIMENTAL

Materials

Methods

IONIC CONDUCTIVITY OF PEO NANOCOMPOSITES

COOPERATIVE MOTION: TSC AND DSC

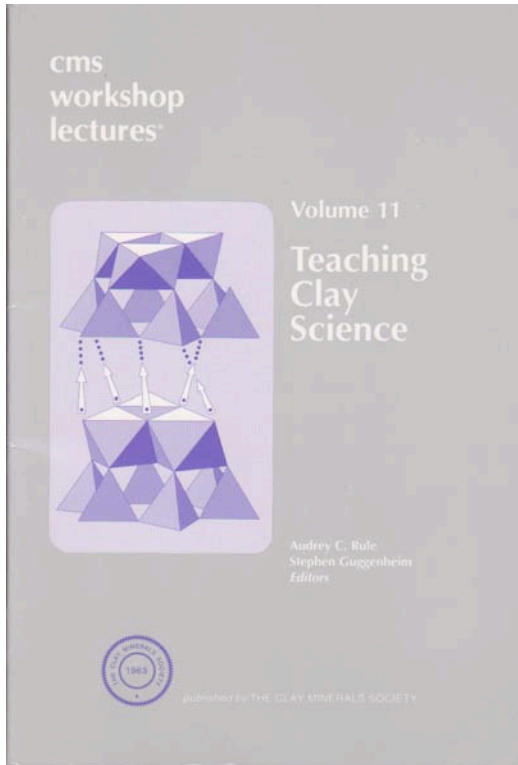
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COMPUTER SIMULATIONS OF NANOCOMPOSITES

CONCLUSIONS

ACKNOWLEDGEMENT

REFERENCES



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INTRODUCTION
LEARNING THEORY

Constructivism and Piaget's Concepts of Learning
The Learning Cycle
Vygotsky's Zone of Proximal Development

SCIENCE EDUCATION STANDARDS

Origin of the Standards
The Benchmarks for Scientific Literacy
The Benchmarks for Understanding the Nature of Science
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National Science Education Standards
Science Content Standards of the National Science Education
Standards

REFERENCES

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INTRODUCTION

USING THE LEARNING CYCLE TO TEACH STUDENTS ABOUT COLLOIDS

Piaget's Concepts of Learning

The Learning Cycle

Exploration phase of the learning cycle

Directions for preparing the discrepant event

Explanation phase of the learning cycle

The chemistry of colloids

Coagulation and flocculation

Expansion phase of the learning cycle

Industrial use of bentonite

Directions for preparing the expansion phase activity

USING ANALOGIES TO TEACH STUDENTS ABOUT COLLOIDS

Exploration phase

Explanation phase: Bridging and pictorial analogies

Expansion phase: Generative analogies'

ACKNOWLEDGEMENTS

REFERENCES

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Clay Science.....Stephen Guggenheim and Sharon Kane

INTRODUCTION

COOPERATIVE LEARNING AND TEACHING CLAY SCIENCE

Cooperative learning

Clay science

GROUP INVESTIGATION

Applications to secondary school classes

Applications to college students

Applications to clay science classes

JIGSAW STRATEGIES

Applications in secondary schools

Applications to clay science classes

PREPARING STUDENTS TO WORK COLLABORATIVELY

CONCLUSIONS

ACKNOWLEDGMENTS

REFERENCES

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INTRODUCTION

RUBRICS

Exercise #1, chocolate chip cookies

Subjective Evaluation

Objective Evaluation

Exercise #2, evaluation of landfill material

Exercise #3, evaluating reports

CONCLUDING COMMENTS

REFERENCES

SUGGESTED ADDITIONAL INFORMATION ABOUT RUBRICS

AND ASSESSMENT

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INTRODUCTION

USEFULNESS OF ANALOGIES

The Importance of Making Connections in Memory and Learning

Characterizing Analogies

Analogies in Teaching and Creativity

Improving Student Understanding with Analogies

IMPROVING STUDENT UNDERSTANDING WITH ANALOGIES

Exploration Phase

Explanation Phase

Expansion Phase

ACKNOWLEDGEMENTS

REFERENCES

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Utilization.....Jessica Elzea Kogel and Audrey C. Rule

INTRODUCTION

LABORATORY EXERCISE

Part I: Kaolin utilization

Part II: Kaolin type and grade

Part III: Grading kaolin for mining

Part IV: Prepare cross-sections

Part V: Final Report

INFORMATION FOR INSTRUCTORS

- Purpose
- Exploration phase
- Explanation phase
- Expansion phase
- Organizing the exercise
- Required background information
- Materials
- Possible modifications
- Answers/solutions to the exercise
- Answers to questions in Part II
- Comments on cross-sections
 - Kaolin Layer #1
 - Kaolin Layer #2
- Authentic Assessment with scoring rubric

REFERENCES

DATA SHEETS

Use of Multimedia to Enhance Clay Mineralogy Laboratory
Activities.....Ray E. Ferrell, Johan Forsman, and Wanda S. LeBlanc

INTRODUCTION

POWERPOINT METHODS

EXTRACTION OF CLAY FRACTION

SMEARED-SLIDE PREPARATION

SUMMARY

Determination of Illite Crystallite Thickness Distributions by X-ray
Diffraction, and the Relationship of Thickness to Crystal Growth Mechanisms by
the use of MudMaster, GALOPER, and Related Computer
Programs D. D. Eberl

INTRODUCTION

EXERCISES

- Explanation
- Exploration
 - Exercise A: MUM's the word
 - Exercise B: Determination of CTD's for natural illites
- Expansion
 - Exercise C: Simulation of illite growth with GALOPER
 - Exercise D: Statistical comparison of calculated
and measured CTD's
 - Exercise E: Decomposition of illite CTD

CAUTION AND CONCLUSION
ACKNOWLEDGEMENTS
REFERENCES

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Techniques.....Stephen Guggenheim

PART 1. MEDICAL X-RAY FILMS AND ANALYTICAL X-RAY
FILMS

PART 2. THE NATURE OF DIFFRACTION

Background

Unit spacings in diffraction

The intensity of diffraction

Experimental Procedure

A. Initial set up: the magnification factor

B. Projection vs. diffraction?

C. The effect of the wavelength of light

D. Calculation of various grating sizes

E. One-dimensional diffraction

PART 3. X-RAY DIFFRACTION OF CLAY MINERALS

Background

Experimental

COMMENTS TO THE INSTRUCTOR

Required materials

Discussion

ACKNOWLEDGMENTS

REFERENCES

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Experiments.....Brenda Ross and Stephen Guggenheim

PART 1. EXCHANGE AND SOLVATION

Introduction

Layer charge

Exploration

Expandable clays

Explanation: Identification of vermiculite vs. smectite

Required materials

Step 1. Exchange of Mg
Step 2. Preparing an oriented clay-aggregate slide
Step 3. Glycerol solvation
Ethylene glycol solvation: Alternative approach
Step 4. X-ray diffraction procedures
Expansion

PART 2. INTERCALATION AND CHEMICAL INTERCALATION

Introduction
Exploration
Experimental Design: The benzidine blue reaction
Intercalation of the organic amine: Step 1A. 1,4-phenylenediamine
Intercalation of the organic amine: Step 1B. N,N,N',N'-
Tetramethylbenzidine
Step 2. Preparing an oriented clay-aggregate slide
Step 3. X-ray diffraction procedures

NOTES TO THE INSTRUCTORS

Introduction
Materials
Safety
Additional comments
Part 1. Exploration
Other notes
Part 2. Experimentation
Overview
Answers to exploration questions

ACKNOWLEDGMENTS

REFERENCES

Infrared Spectroscopy in Clay Science.....Paul A. Schroeder

INTRODUCTION

BACKGROUND

Structure
Theory
Molecular and crystal vibrations
Exploration Phase Activity 1
Exploration Phase Activity 2
Instrumentation and sample preparation
for IR experiments

RESULTS AND DISCUSSION

Explanation Phase Activity
Hydroxide sheets
IR spectra of layer silicates
 1:1 layer silicates
 2:1 layer silicates with zero layer charge
 2:1 layer silicates with layer charge

SUMMARY

ACKNOWLEDGEMENTS

REFERENCES

LABORATORY EXERCISE IN INFRARED

SPECTROSCOPY

 Required materials Procedures
 Analysis and discussion after completing the experiments
 Questions for discussion

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Application.....Jean Hemzacek Laukant

INTRODUCTION

 A Note about Nomenclature

COMPARISON OF WATER AND OIL SORPTION

 Exploration
 Explanation
 Expansion

COMPARISON OF SWELLING CAPACITY

 Exploration
 Explanation
 Expansion

APPARENT VISCOSITY OF CLAY DISPERSIONS:
RHEOLOGY WITHOUT THE CALCULUS

 Exploration
 Explanation
 Expansion

INSTRUCTOR'S NOTES

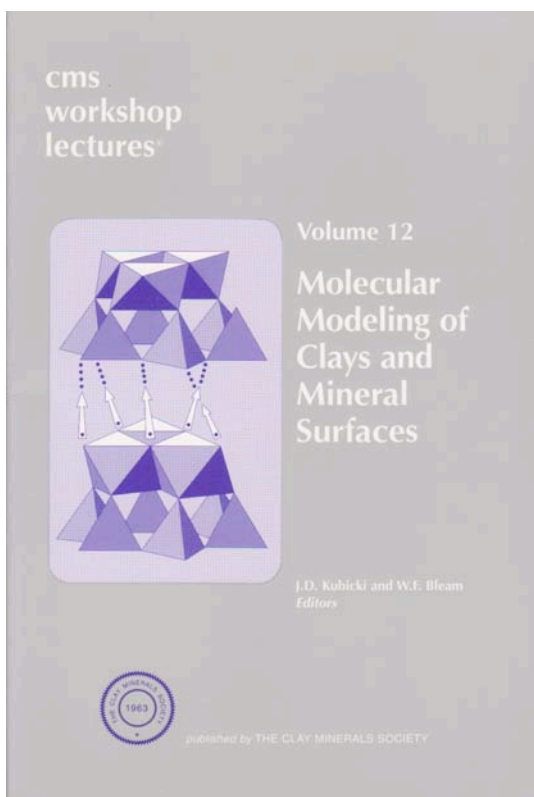
 Exploration
 Materials and Preparation
 General Comments

Water and Oil Sorption
Swelling capacity
Apparent viscosity of clay dispersions

REFERENCES

APPENDIX I

APPENDIX II



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Introduction
Types of Molecular Modeling
 Molecular Orbital and Density Functional Theories
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 Molecular Mechanics
Hardware Considerations
Future Directions in Geochemical Molecular Modeling
References

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Introduction
Molecular Modeling Methods: Electronic Structure Methods:
Fundamental Issues, Energy Scales
Empirical Methods
 Metal Complexation with Hydroxide
Electronic Structure Method

- DFT and Wavefunction Approaches
 - Basic Sets: Gaussian function and planewaves
 - Boundary Conditions: Cluster and Periodic Systems; Solvation
 - Cluster and Periodic Calculations
 - Treatment of Solvent
 - Remarks Concerning Electronic Structure Methods
- Force Field Methods: The Stillinger-David Water Model
- Example Problems and Applications
 - Water
 - Ions in Water, Hydrolysis
 - Complexation
 - Mineral Surfaces
 - Structure and Energetics of Surfaces
 - Surface Protonation and Hydroxylation
 - Empirical Methods
 - Periodic Electronic Structure Methods
 - Cluster Electronic Structure Methods
 - Analytical Potential Methods
 - Solvent Effects at Interfaces
- Outlook
- References

Chapter 3- Monte Carlo and Molecular Dynamics Computer Simulation of
 Aqueous Interlayer Fluids in Clays N. T. Skipper

- Introduction
- Intearticle Potential Energy Functions
- Empirical Molecular Models of Clay Fluid Interactions
 - Water-Water Interactions
 - Conterion-Water Interactions
 - Water-Clay and Conterion-Water Ineractions
 - Clay-Clay Interactions
 - Other Solutes
- Computer Modeling of Macroscopic Systems: General Principles
 - Periodic-Boundry Conditions and Pseudomacroscopic Systems
 - Treatment of Long-Range and Short-Range Interactions
 - Image Conventions
 - Choice of Statistical Ensemble
- Monte Carlo
 - General Principles
 - Monte Carlo Studies of Clay-Fluid Systems
- Molecular Dynamics
 - General Principles
 - Molecular Dynamics Studies of Clay Fluid Systems
- Conclusions
- Acknowledgements
- References

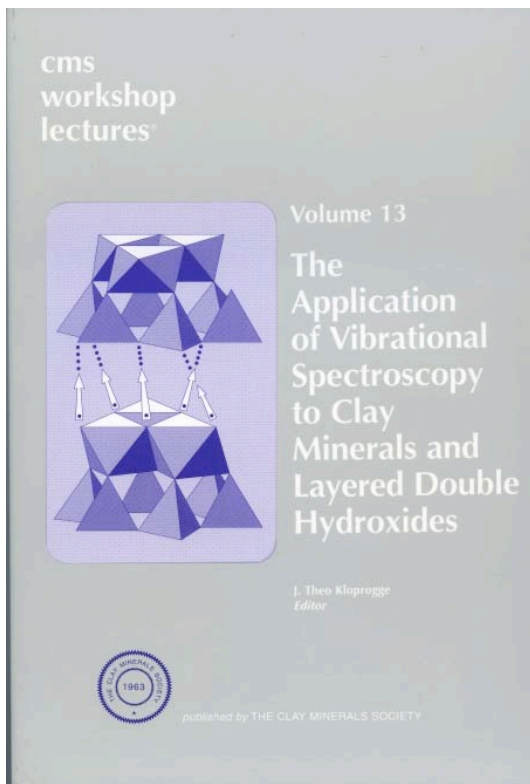
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- Introduction
- Energy and Interatomic Forcefields
 - Bonded Forcefields
 - Ionic Forcefields
 - Parameterization of Forcefields
 - Selected Forcefields
- Theoretical Methods and Modeling Tools
 - Molecular Orbital Methods
 - Energy Minimization
 - Monte Carlo Methods and Molecular Dynamics
 - Electrostatic Potential Surfaces
- Clay Mineral Structures
 - Bulk Structures
 - Surface Structures
- Atomic Models of Metal Sorption on Clays
 - Molecular Electrostatic Potential Surface of Kaolinite
 - Surface Energy Maps for Metal Sorption
 - Molecular Models for Metal Sorption
- Summary
- Acknowledgements
- References

Chapter 5 - Modeling the Binding of Protons and Metal Ions by Humic Substances.....E. Tipping

- Abstract
- Introduction
- Humic Substances
 - Definition
 - Formation
 - Fractions
 - Properties
- Observation and Interpretation of Ion Binding Behavior
 - Protons
 - Metal Ions
- Parameterized Models
 - Early Models
 - The Discrete Site "Polyelectrolyte" Approach
 - Humic Ion Binding Model VI
 - The Continuous Distribution Approach
 - The Master Curve
 - The NICA-Donnan Model
 - Discrete log K Spectrum Model

Current Status of Parameterized Models
Applications to Natural Systems
Predictive Modeling
The Random Molecular Model
Electrostatic Modeling
Possible Developments
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INTRODUCTION

What is vibrational spectroscopy?

INFRARED AND NEAR-INFRARED SPECTROSCOPY

Mid-infrared spectroscopy
Near-infrared spectroscopy

RAMAN SPECTROSCOPY

Introduction
Principles of the Raman effect
Polarizability
Absorption and fluorescence

CONCLUSIONS
REFERENCES

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Intercalates.....Ray L. Frost and Wayde N. Martens

INTRODUCTION
INTERCALATION OF KAOLINITE
The technique of intercalation
Intercalation with formamide
Intercalation with hydrazine
Intercalation with dimethylsulfoxide
Intercalation with potassium acetate
Intercalation with cesium acetate

EXPERIMENTAL TECHNIQUE OF RAMAN MICROSCOPY OF
KAOLINITE
The Raman microscopic technique

SUMMARY
ACKNOWLEDGMENTS
REFERENCES

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INTRODUCTION
THE HYDROXYL GROUP: A GOOD PROBE OF THE CLAY
CRYSTAL-CHEMISTRY

The hydroxyl group vibrations
Effect of the octahedral environment
Effect of the surrounding tetrahedral environment:
Example of the synthetic Ge-talcs
Ordered-disordered cationic distribution
Example of Ni-Mg talcs
Example of Ni-Co kerolites

APPLICATION TO NATURAL TALCS: POTENTIAL OF THE NIR
REGION

Materials
Comparison between MIR and NIR
Chemical composition calculation

Cation distribution
Proposal of structural formulae

SUMMARY AND CONCLUSIONS
ACKNOWLEDGMENTS
REFERENCES

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fractions of bentonites.....Jana Madejová and Peter Komadel

INTRODUCTION
CHARACTERIZATION OF BENTONITES

Identification of silica admixtures
Identification of layer silicate admixtures
Identification of kaolinite in smectite rich samples
Identification of mixed-layer illite-smectite
Identification of other admixtures

CHARACTERIZATION OF SMECTITES

Identification of smectites
Distribution of the central atoms in the octahedral sheets of
smectites

SUMMARY
ACKNOWLEDGMENTS
REFERENCES

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clay minerals.....J. Theo Kloprogge and Ray L. Frost

INTRODUCTION
THE THEORY OF INFRARED EMISSION SPECTROSCOPY (IES)
EXPERIMENTAL METHODS
THE EXAMPLE OF CALCIUM OXALATE DIHYDRATE
IES OF CLAY MINERALS

Kaolinite group
Smectite group
Interstratified clay minerals

Chlorite group
Modulated clay minerals

ACKNOWLEDGMENTS
REFERENCES

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INTRODUCTION
BACKGROUND AND THEORY

Structural considerations of isomorphous substitution Affects of
isomorphous substitutions on bond strength
and H-bonding
Mass and valence of OH - sharing cations

SAMPLES STUDIED

Chemistry of samples
Infrared spectroscopy

OCTAHEDRAL SITE OCCUPANCIES

Octahedral cation-OH bend and lattice deformations (1100- 550
 cm^{-1})
Octahedral cation - OH stretching (3700 - 3500 cm^{-1}) Octahedral
cation - OH combination (4800 - 3800 cm^{-1})

OCTAHEDRAL CATION COMPOSITION
NEIGHBORING OCTAHEDRAL AND TETRAHEDRAL SITES

Influence of layer charge location
Influence of Fe^{3+}

SUMMARY AND CONCLUSIONS
ACKNOWLEDGEMENTS
REFERENCES

Studies of Reduced-Charge Smectites by Near Infrared

Spectroscopy J Madejová

INTRODUCTION
MATERIALS AND METHODS
FIXATION OF SMALL EXCHANGEABLE CATIONS IN SMECTITES

Fixation of Li⁺ in SAz-1 montmorillonite
Layer charge characterization of NH₄-saturated smectites
NIR spectra of dioctahedral smectites
NIR spectra of reduced-charge Li-Saz
The effect of chemical composition on the infrared spectra of Li-saturated dioctahedral smectites
The effect of ion size and charge of exchangeable cations on the extent of their fixation in montmorillonites

ACID DISSOLUTION OF REDUCED-CHARGE SMECTITES

NIR study of structural modifications of Li- and Ni-montmorillonites upon acid treatment

SUMMARY
ACKNOWLEDGEMENT
REFERENCES

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INTRODUCTION
FACTOR GROUP ANALYSIS
THE HYDROXIDE LAYERS
WATER
SIMPLE INTERLAYER ANIONS

CO₃²⁻
NO₃⁻
SO₄²⁻
ClO₄⁻

THERMAL BEHAVIOR
ACKNOWLEDGEMENTS
REFERENCES

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INTRODUCTION
MOLECULAR DYNAMICS MODELING
INTERATOMIC POTENTIALS
ANALYSIS OF ATOMIC VIBRATIONAL DYNAMICS FROM MD SIMULATIONS

EXPERIMENTAL FAR INFRARED SPECTRA OF LDH PHASES
COMPARISON OF CALCULATED AND OBSERVED DATA

Ca₂Al-Cl LDH
LiAl₂-Cl LDH
LiAl₂-SO₄ LDH
Mg₃Al-Cl LDH

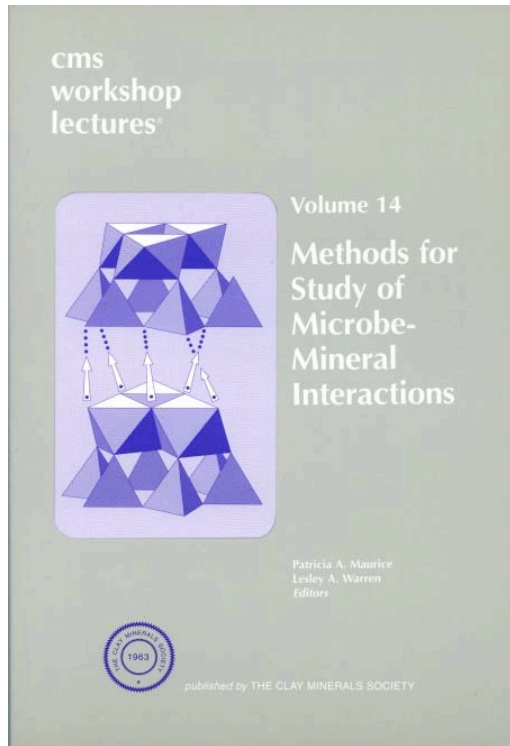
POWER SPECTRA OF AQUEOUS SPECIES ASSOCIATED WITH

LDH SURFACES

CONCLUSIONS

ACKNOWLEDGEMENTS

REFERENCES



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INTRODUCTION
MICROBIAL SIZE AND DIVERSITY
BACTERIAL ENVIRONMENTS AND BIOGEOCHEMICAL
RESPONSES
EXAMPLES OF SOME GEOLOGICALLY RELEVANT
MICROORGANISMS
MICROBIAL GROWTH IN BATCH REACTORS
MICROBIAL ATTACHMENT TO SURFACES: BIOFILMS
METAL REACTIVITY: LINKS TO MINERALOGY AND
MICROORGANISMS
METAL REACTIVITY: SIDEROPHORES
METAL REACTIVITY: APPROACH TO FIELD INVESTIGATION
EXAMPLE OF A FIELD APPROACH: ACID-ROCK DRAINAGE
PERSPECTIVE OF CURRENT STATUS OF THE FIELD
REFERENCES

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mineral surfaces.....Philip C. Bennett, Annette Summers Engel,
and Jennifer A. Roberts

INTRODUCTION

SAMPLE COLLECTION AND PRESERVATION

Sterile Technique

Aerobic vs. Anaerobic Samples

In Situ Microcosms

Sample Preservation

BIOMASS DETERMINATION

Direct Counting

Procedure 1: DAPI Cell Count: Sandy Sediment

Rock MPN

SEM Surface Counts

Quantitative FISH

Procedure 2: Sample Collection and Preservation for FISH

Procedure 3: Slide Preparation and Cell Fixation for FISH

Procedure 4: Hybridization

Procedure 5: Post-hybridization

Procedure 6: Examination and Quantification

Chemical Biomass

Procedure 7: Lipid Phosphate Extraction and Measurement

CONVENTIONAL SCANNING ELECTRON MICROSCOPY

Sample Preparation

Procedure 8: Chemical Critical Point Drying

Artifacts

ENVIRONMENTAL SCANNING ELECTRON MICROSCOPY

Sample Preparation

Imaging

Pros and Cons

CASE STUDY: LOWER KANE CAVE

REFERENCES

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Fe(III) oxides.....Susan L. Brantley, Shane Ruebush,
Je-Hun Jang, and Ming Tien

INTRODUCTION
ABIOTIC NONREDUCTIVE MINERAL DISSOLUTION SYSTEMS

Reaction Kinetics
Abiotic chemical reactors
Abiotic mineral dissolution
Ligand-promoted mineral dissolution

ABIOTIC REDUCTIVE MINERAL DISSOLUTION
BIOTIC MINERAL DISSOLUTION SYSTEMS

Michaelis-Menton kinetics
Microbial growth kinetics and Monod fitting
Comparing reactions in vitro and in vivo
Steady state versus transient state methods
In silico: Kinetic simulation

CONCLUSIONS
ACKNOWLEDGEMENTS
REFERENCES

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INTRODUCTION
MICROBIAL CONSIDERATIONS

Biotransformation Mechanisms
Cultivation and Cell Physiology

MINERALOGIC CONSIDERATIONS

Fe(III) Oxide

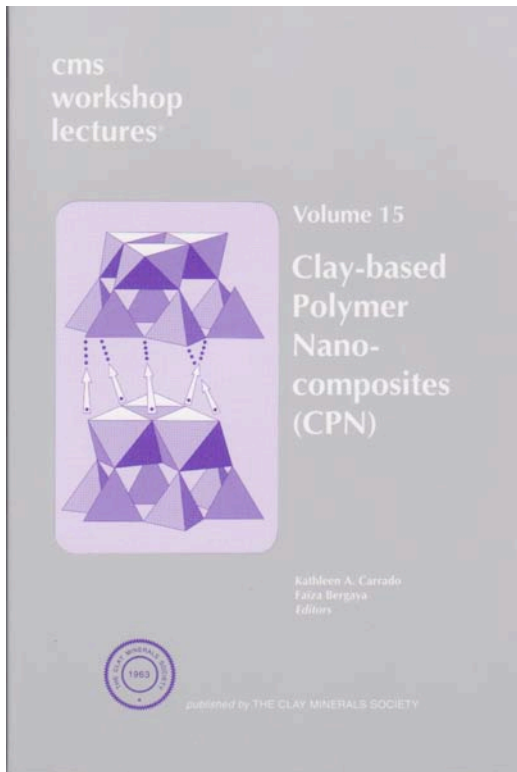
EXPERIMENTAL CONSIDERATIONS
MICROBIAL MOLECULAR TOOLS

Mutigenesis
Gene Activity Reporters
Molecular Profiling

BIOMINERALIZATION CHARACTERIZATION TOOLS RESEARCH
EXAMPLES

Biogenic Mn(II/III/IV) Oxides
Fe Biomineralization in Batch Reactors
Fe Biomineralization Under Advective Conditions

CONCLUSIONS
ACKNOWLEDGEMENTS
REFERENCES



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INTRODUCTION
CLAY SURFACE MODIFICATION
CPN PREPARATION METHODS
CHARACTERIZATION OF CLAY NANOLAYER DISPERSION
NANOLAYER ORIENTATION
SYNTHETIC MATERIALS FOR POLYMER REINFORCEMENT
CONCLUSIONS
ACKNOWLEDGMENTS
REFERENCES

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INTRODUCTION
ORGANO-CLAYS AS NANOFILLERS
ORGANO-MODIFIED MONTMORILLONITE POLYMER
NANOCOMPOSITES

- Methods of production
 - Via melt intercalation
 - Thermodynamics of formation: miscibility issues
 - Kinetics of intercalation
 - Effect of processing conditions on morphology
 - Via intercalation polymerization
- Nanocomposite properties
 - Tensile, elongation and impact properties
 - Dynamic mechanical analysis (DMA)
 - Barrier properties
 - Thermal stability
 - Flame resistant behavior

CASE STUDY: BIODEGRADABLE CLAY POLYESTER NANOCOMPOSITES

- Via melt intercalation
- Via in situ catalyzed polymerization

CONCLUSIONS
ACKNOWLEDGEMENTS
REFERENCES

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INTRODUCTION

- Small amount, big impact

THE CLAY MINERAL, A SOLID INORGANIC POLYMER

- Clay vs. clay minerals
- Clay minerals as layered (hydr)oxides or inorganic polymers

WHY ARE CLAY MINERALS, ESPECIALLY SMECTITES, PRESENTLY SO ATTRACTIVE IN NANORESEARCH?

- Raw clays
- Clay mineral purification
- Synthetic clay minerals
- Organoclays
- Other modified clays and clay minerals

CLAY MINERAL PROPERTIES INVOLVED IN CLAY POLYMER INTERACTION

- Properties of smectites
- Clay mineral—polymer interfacial interaction

OPTIMIZED PROPERTIES TOWARDS OPTIMIZED PERFORMANCE

- Always an optimum
 - Intercalation vs. delamination/exfoliation
 - Exfoliation vs. homogeneous dispersion of clay mineral

particles in polymer matrix
Hydrophilic/lipophilic balance of clay minerals
and polymers
Size of interlayer space vs size of polymer
Influence of preparation and processing methods
In-situ polymerization
Direct additions of liquid, melted or solid polymers Other
manufacturing processes

FUTURE OUTLOOK

EFFECTIVE CPN COMMERCIAL APPLICATIONS

Automotive industry
Electrical equipment
Packaging
Engineering plastics

ACKNOWLEDGEMENTS

REFERENCES

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CPN.....L. F. Drummy, H. Koerner, B. L. Farmer, and
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INTRODUCTION

REAL SPACE - MICROSCOPY

Surface Imaging
Transmission Imaging
Light Microscopy
Transmission Electron Microscopy
Sample Preparation
Contrast
Phase Contrast HREM
Low Dose
3D Imaging
Reproducible, Quantitative Image Analysis

RECIPROCAL SPACE - SCATTERING

Wide Angle Scattering
Small Angle Scattering
3D Reciprocal Space - Orientation Effects

INTERFACIAL AREA

NMR
Optical spectroscopy
Dielectric Spectroscopy

PHYSICAL EFFECTS

- Barrier
- Bulk Mechanical Properties
- Rheology

DISCUSSION AND CONCLUSIONS

ACKNOWLEDGEMENTS

REFERENCES

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INTRODUCTION

FLAME RETARDANT CLAY-BASED POLYMER NANOCOMPOSITES

- Initial Discoveries
- Flame Retardant Mechanism

HIGH THROUGHPUT METHODS DEVELOPMENT

- Compounding, Sample Extrusion and Flammability Measurements
- Laser Scanning Confocal Microscopy
- Characterization of Fluorescent Layered Double Hydroxide-Based Nanocomposites

CONCLUSIONS AND FUTURE DIRECTIONS

NOTE

REFERENCES

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INTRODUCTION

- Strategies of Synthesis for Preparation of CPN

CLAY-BASED POLYMER NANOCOMPOSITES WITH IONIC CONDUCTIVITY

- Polymer Electrolytes for Electrochemical Devices
- CPN Based on Poly(ethylene oxide)
- CPN for Fuel-cell Applications

CPN BASED ON CONDUCTING POLYMERS

- Electronically Conducting Polymers
- CPN based on Conducting Polymers

CPN AS SOURCE OF CARBON CONDUCTING SYSTEMS

CONCLUDING REMARKS AND RESEARCH TRENDS

ACKNOWLEDGEMENTS
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INTRODUCTION
METAL NANOPARTICLES ON CLAYS
PURE POLYMER FILMS EMBEDDED WITH METAL
NANOPARTICLES

CPN FILM FORMATION
Overview of CPN Films for Gas Barrier Applications Synthetic
Hectorite-Based CPN Films

METAL NANOPARTICLES ON CPN FILMS
Synthesis
Results and Discussion
X-ray Powder Diffraction
Transmission Electron Microscopy
Small angle X-ray Sattering (SAXS)
Thermogravimetric Analysis

POTENTIAL APPLICATIONS
ACKNOWLEDGEMENTS
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INTRODUCTION
STATE OF THE ART

STRATEGIES FOR BIONANOCOMPOSITE SYNTHESIS
Direct Intercalation of Charged Biopolymers
Template Assembly of LDH with Charged Biopolymers
In situ Formation of Clay Mineral Caramel Nanocomposites

PALYGORSKITE- AND SEPIOLITE-BASED
BIONANOCOMPOSITES
BIONANOCOMPOSITES FOR ELECTROANALYTICAL
APPLICATIONS
CONCLUDING REMARKS
ACKNOWLEDGEMENTS
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INTRODUCTION

CASE STUDIES

Strong Young Modulus Reinforcement:

Montmorillonite/nylon

Poor Young Modulus Reinforcement: SWCNT/epoxy

POLYMER REINFORCEMENT AND THE LIQUID-GLASS

TRANSITION IN CONFINED GEOMETRY

The Glass Transition in Thin Polymer Films: Experimental Results

The Free Volume Picture of the Glass Transition: A Reminder

The Glass Transition in Thin Polymer Films: Models

The Weak Interface Case (Bad Wetting) 2 The Strong

Interface Case (Good Wetting)

CONFINED POLYMER LAYERS

CONCLUSION

REFERENCES



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