

## VITAE

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#### EDUCATION

Ph.D., GEOLOGY, 1972, Virginia Polytechnic Institute and State University,  
Blacksburg, Virginia. Dissertation: Structural and crystal chemical studies of the feldspars.  
Adviser: Paul H. Ribbe

B.S., GEOLOGICAL ENGINEERING, 1965, North Carolina State University,  
Raleigh, North Carolina.

#### PROFESSIONAL EXPERIENCE

The University of Toledo, Toledo, OH  
Professor and Chair 1994 - present  
Professor 1990-1994  
Associate Professor 1980-1989  
Assistant Professor 1975-1980

Arizona State University, Tempe, AZ  
Visiting Assistant Professor 1974-75

Institut für Mineralogie  
Westfälische Wilhelms-Universität, Münster, F.R.G.  
Research Associate 1973-1974

Virginia Polytechnic Institute and State University, Blacksburg, VA  
Research Associate 1972-1973  
Graduate Research Assistant 1971-72  
Graduate Teaching Assistant 1970-71  
State of Virginia Scholarship 1968-70  
National Science Foundation Traineeship 1967-68

Southern Illinois University, Carbondale, IL

Graduate Research Assistant 1966-67  
Graduate Teaching Assistant 1965-66  
Bear Creek Mining Co., Eastern States Project, Knoxville, TN  
Assistant Geologist (Summer 1965)

### **Professional Societies**

Mineralogical Society of America  
American Geophysical Union  
Mineralogical Association of Canada

### **Honorary Societies**

Phi Kappa Phi  
Sigma Xi

## **TEACHING ACTIVITIES**

### **Courses Taught at UT (Quarter System)**

Geol 100	Physical Geology	4 credits (later called Geol 110)
Geol 121	Geologic Hazards	3 credits
Geol 211	Earth Science & Man	3 credits (later called Geoscience Concepts)
Geol 222	Crystallography and Mineralogy	5 credits
Geol 325	Engineering Geology	4 credits*
Geol. 365	Summer Field Camp	8 credits*
Geol 400/607	Optical Mineralogy	5 credits
Geol 401/616	Igneous & Metamorphic Petrology	5 credits*
Geol 601	Advanced Mineralogy	5 credits
Geol 605	Instrumentation	5 credits*
Geol 611	X-ray Diffraction	2 credits
Geol 688	Clay Mineralogy	5 credits*

- \* indicates that the course was team taught

### **Courses Taught at UT (Semester System)**

Geol 1010	Physical Geology	3 credits
Geol 2210	Mineralogy	3 credits
Geol 3220	Geochemistry	3 credits

### **Senior Honors Theses Advised**

Croydon, Robert M. (1984): Hydrothermal synthesis of sodium silicates. 9pp.

Beverstock, David M. (1986): A refinement of the crystal structure of pollucite. 21pp.

### **M.S. Theses Advised**

Killberg, Glenn. C., (1978): The crystal chemistry of pegmatitic perthites from the Black Hills, South Dakota. 58pp.

Ryder, Henry. L., (1978): The placement of the staurolite and sillimanite isograds in the Hill City and Mount Rushmore Quadrangles, South Dakota. 82 pp. (John Shade, co-advisor)

Chyi, Kwo Lin, (1980): Hydrothermal stability study of supercalcine. 95pp.

Wegert, Emily L. (1981): Cation exchange in pollucite. 64pp.

Watkins, Michael L. (1986): Joint analysis and diagenetic studies in the upper Rockdale Run formation (lower Ordovician) in the Great Valley of West Virginia. 127pp. (S. L. Dean, co-advisor)

DeMasi, Amy E., (1988): An investigation of the compatibility of zirconium with structures of zeolites Na-A and faujasite. 75pp.

Zhang, H., (1988): A structural investigation of the “room temperature” transformation in maximum microcline. 97pp.

Kaspar, Jeffery, (1989): A structural investigation of oxidation-dehydrogenation effects in magnesio-hornblende. 83pp.

Stefanish, Heather L., (1989): A structural investigation of oxidation-dehydrogenation effects in riebeckite. 67pp.

Miranda, Conrado R., (1991): A statistical examination of octahedral ordering and inter-atomic distances and angles in *C2/m* calcic amphiboles. 91pp.

Basso, Charles L., Jr., (1995) Dispersion of the optic axial angle as a measure of Fe<sup>2+</sup>/Mg ratio in the tremolite-actinolite solid solution series: A spindle stage investigation. 67pp.

Jiang, Yonghong, (in progress) A Visual-Basic program to calculate electrostatic bond strengths. (V.M. Brown, co-advisor)

## **PUBLICATIONS**

### **Articles (Refereed Journals)**

- Phillips, M.W., A.A. Colville and P.H. Ribbe (1971) The crystal structures of two oligoclases: A comparison with low and high albite: *Zeitschrift für Kristallographie (Laves Festband)*, 133, 43-65.
- Foit, F.F., M.W. Phillips and G.V. Gibbs (1973) A refinement of crystal structure of datolite,  $\text{CaBSiO}_4(\text{OH})$ : *American Mineralogist*, 58, 909-914.
- Phillips, M.W. and P.H. Ribbe (1973) The variation of tetrahedral bond lengths in sodic plagioclase feldspars: *Contributions to Mineralogy and Petrology*, 39, 27-339.
- Phillips, M.W. and P.H. Ribbe (1973) The structure of monoclinic potassium-rich feldspars: *American Mineralogist*, 8, 263-270.
- Phillips, M.W. and P.H. Ribbe, and G.V. Gibbs (1973) Tetrahedral bond length variations in anorthite: *American Mineralogist*, 58, 495-499.
- Phillips, M.W., G.V. Gibbs and P.H. Ribbe (1974) The crystal structure of danburite: A comparison with anorthite, albite and reedmergnerite: *American Mineralogist*, 59, 79-85.
- Phillips, M.W., H. Kroll, H. Pentinghaus and P.H. Ribbe (1975) The structure of synthetic paracelsian analogs,  $\text{SrGa}_2\text{Si}_2\text{O}_8$  and  $\text{SrGa}_2\text{Ge}_2\text{O}_8$ : *American Mineralogist*, 60, 659-666.
- Kroll, H. and M.W. Phillips (1976) Comparison of feldspar and paracelsian-type structures: *Zeitschrift für Kristallographie*, 143, 285-299.
- Hesse, K.F., F. Liebau, H. Boehm, P.H. Ribbe and M.W. Phillips (1977) Disodium zincosilicate,  $\text{Na}_2\text{ZnSi}_3\text{O}_8$ : *Acta Crystallographica*, B33, 1333-1339.
- Kroll, H., M.W. Phillips and H. Pentinghaus (1978) The structures of synthetic feldspar analogues,  $\text{SrGa}_2\text{Si}_2\text{O}_8$ ,  $\text{BaGa}_2\text{Si}_2\text{O}_8$ , and  $\text{BaGa}_2\text{Ge}_2\text{O}_8$ : *Acta Crystallographica*, B34, 359-365.
- Schlenker, J.L., D.T. Griffen, M.W. Phillips and G.V. Gibbs, (1978) A population analysis for Be and B oxyanions: *Contributions to Mineralogy and Petrology*, 65, 347-350.
- Davies, J.A., R.J. Shaver, A. Sood, M.W. Phillips, M. Watkins, C. Fyfe and M. McKinnon (1987) Cyanomethylated Polystyrene: Synthesis, Characterization and Coordination Chemistry with Palladium II. *Macromolecules*, 20, 2669-2674.
- Phillips, M.W., R.K. Popp, and C.A. Clowe (1988) Structural adjustments accompanying oxidation-dehydrogenation in amphiboles: *American Mineralogist*, 73, 500-506.
- Phillips, M.W., J.E. Draheim, R.K. Popp, C.A. Clowe, and A.A. Pinkerton (1989) Effects of

oxidation-dehydrogenation in tschermakitic-hornblende: *American Mineralogist*, 74, 764-773.

Phillips, M.W., P.H. Ribbe, and A.A. Pinkerton (1989) Structure of intermediate albite, NaAlSi<sub>3</sub>O<sub>8</sub>: *Acta Crystallographica C*45, 542-545.

Popp, R.K., M.W. Phillips, and J.A. Harrell (1990) Accommodation of ferric iron in natural, Fe<sup>3+</sup>-rich calcic and subcalcic amphiboles: Evidence from published chemical analyses: *American Mineralogist*, 75, 163-169.

Phillips, M.W., R.K. Popp and C.A. Clowe (1991) A structural investigation of oxidation effects in grunerite. *American Mineralogist*, 76, 1502-1509.

Kroll, H., H. Schlenz and M.W. Phillips (1994) Thermodynamic modelling of non-convergent ordering in orthopyroxenes: A comparison of classical and Landau approaches. *Physics and Chemistry of Minerals*, 21, 555-560.

Popp, R. K., D. Virgo, H.S. Yoder, T.C. Hoering, and M.W. Phillips (1995) An experimental study of phase equilibria and Fe oxy-component in kaersutitic amphibole: Implications for  $f_{H_2}$  and  $a_{H_2O}$  in the upper mantle. *American Mineralogist*, 80, 534-548.

Popp, R.K., D. Virgo and M.W. Phillips (1995) H deficiency in kaersutitic amphiboles: Experimental verification. *American Mineralogist*, 80, 1347-1350.

### **Articles (Conference Proceedings)**

Gibbs, G.V., S.J. Louisnathan, P.H. Ribbe and M.W. Phillips (1974) Semi-empirical molecular orbital calculations for the atoms of the tetrahedral framework in anorthite, low albite, maximum microcline and reedmergnerite: In W.S. MacKenzie and J. Zussman, Eds., *Proceedings of the NATO Advanced Studies Institute on Feldspars*, Manchester University Press, 49-68.

Ribbe, P.H., M.W. Phillips and G.V. Gibbs (1974) Tetrahedral bond length variations in feldspars: in W.S. MacKenzie and J. Zussman, Eds., *Proceedings of NATO Advanced Studies Institute on Feldspars*, Manchester University Press, 26-48.

Phillips, M.W. and J.W. Shade (1981) Natural Mineral Analogs of Selected Supercalcine Ceramic HLW Containment Phases: *Proceedings of the First and Second Symposia sponsored by the Eitel Institute and Northwestern Ohio Section of the American Ceramic Society*, p. 10-19.

Phillips, M.W., K.L. Chyi and J.W. Shade (1983) Supercalcine SPC-8a-5: Characterization and Hydrothermal Stability in the Presence of Basalt: *Proceedings of the Third Symposium of the Eitel Institute and Northwestern Ohio Section of the American Ceramic Society*, p. 101-131.

Wegert, E. and M.W. Phillips (1984) Barium compatibility with the pollucite structure: Proceedings of the Fourth Symposium of the Eitel Institute and Northwestern Ohio Section of the American Ceramic Society, p. 73-84.

### **Technical Reports**

Phillips, M.W., J.W. Shade, and A. Kilinc (1979) Durability of crystalline nuclear waste forms at geologic storage conditions: Annual Report to the U.S. Nuclear Regulatory Commission, 107 pp.

Phillips, M.W., A.I. Kilinc, K.L. Chyi, J.W. Shade and E.L. Wegert (1981) Durability of Simulated Supercalcine Ceramics at Geologic Storage Conditions: U.S. Nuclear Regulatory Commission Document NUREG/CR-2418, 146 pp.

### **Book Reviews**

Phillips, M.W., (1979) Book review of "Patterns in Crystals" By Noel F. Kennon. American Scientist, 67, 475-476.

Phillips, M.W. (1983) Book review of "Crystallography, An Introduction for Earth Science and Other Solid State Students" By E.W.J. Whittaker: American Mineralogist, 68, 475.

### **Short Reports**

Popp, R.K., D. Virgo, T.C. Hoering, H.S. Yoder Jr. and M.W. Phillips (1993) Crystal-chemical and phase equilibrium studies of kaersutitic amphibole. Carnegie Institution of Washington, Year Book 92, 93-94.

### **Abstracts**

Phillips, M.W. and W.C. Hood (1965) Hydronium-potassium exchange in trioctahedral micas (abstr.): Journal of the Elisha Mitchell Scientific Society, p. 48.

Phillips, M.W. and P.H. Ribbe (1969) The crystal structure of oligoclase (An 15): Further evidence for a domain model of intermediate plagioclase (abstr.): Geological Society of America, Abstracts with Programs, v.1, n.4, pp.61-62.

Ribbe, P.H., D.B. Stewart and M.W. Phillips (1970) Structural explanations for variation in the lattice parameters of sodic plagioclase (abstr.): Geological Society of America, Abstracts with

Programs, v.2, n.7, p.663.

Phillips, M.W., P.H. Ribbe and G.V. Gibbs (1971) Refinement of the crystal structure of danburite (abstr.): Geological Society of America, Abstracts and Programs, v.3, n.5, p.338.

Gibbs, G.V., S.J. Louisnathan, M.W. Phillips, and P.H. Ribbe (1972) A covalent model for bonding in feldspars (abstr.): Advanced Studies Institute on Feldspars, Programme and Abstracts, Manchester University, England, July 11-20, p. 4.

Phillips, M.W. and P.H. Ribbe (1972) Prediction of individual tetrahedral bond lengths in monoclinic potassium-rich feldspars (abstr.): Advanced Studies Institute on Feldspars, Programme and Abstracts, Manchester University, England, July 11-20, p. 7.

Phillips, M.W., P.H. Ribbe and G.V. Gibbs (1972) Tetrahedral bond length variations in anorthite (rev. abstr.): Transactions of the American Geophysical Union, v. 53, n. 4, p. 48.

Ribbe, P.H., M.W. Phillips and G.V. Gibbs (1972) Bonding in feldspars: A review (abstr.): Advanced Studies Institute on Feldspars, Programme and Abstracts, Manchester University, England, July 11-20, p. 1.

Griffen, D.T., J. Schlenker, G.V. Gibbs, and M.W. Phillips (1973) EHMO bond overlap populations for Be and B oxyanions (abstr.): Transactions of the American Geophysical Union, p. 30.

Phillips, M.W. and P.H. Ribbe (1973) Variation der Bindungslängen in den Alumosilikat-Gerüststrukturen der Feldspäte (abstr.): Vorabdruck aus Zeitschrift für Kristallographie, Akademische Verlagsgesellschaft, Frankfurt a. Main.

Phillips, M.W. and P.H. Ribbe (1973) The variation of tetrahedral bond lengths in sodic plagioclases (abstr.): Transactions of the American Geophysical Union, v. 54, p. 497.

Ribbe, P.H., M.W. Phillips and G.V. Gibbs (1973) Structural comparisons of Na/Ca and B/Al tectosilicates (abstr.): Geological Society of America, Abstracts with Programs, v. 5, n. 7, p. 780.

Phillips, M.W. and H. Kroll (1975) Comparisons of alkaline earth feldspar and paracelsian type compounds (abstr.): Proceedings of the Arizona Academy of Science, p. 46-47.

Phillips, M.W. and H. Kroll (1975) Structures of synthetic paracelsian and celsian type compounds (abstr.): Geological Society of America, Abstracts with Programs, v. 7, n. 3, p. 360.

Phillips, M.W. and H. Kroll (1975) Angular variations in ordered alkaline-earth feldspars (abstr.): Geological Society of America, Abstracts with Programs, v. 7, n. 7, p. 1227.

- Phillips, M.W. (1980) Relative metastabilities of selected rare-earth, uranium and thorium minerals (abstr.): Geological Society of America, Abstracts with Programs, v. 12, n. 5, p. 254.
- Phillips, M.W., Kwo-Ling Chyi and J.W. Shade (1980) Mineral analogs of proposed supercalcine waste forms (abstr.): Journal of the Ohio Academy of Science, Program Abstracts, v. 80, p. 31.
- Chyi, Kwo-Ling, J.W. Shade and M.W. Phillips (1980) Hydrothermal stability of supercalcine ceramics (abstr.): Journal of the Ohio Academy of Science, Program Abstracts, v. 80, p. 33.
- Phillips, M.W., A.I. Kilinc, K. Chyi, J.W. Shade, E.L. Wegert (1982) Durability of simulated supercalcine ceramics at geologic storage conditions. Final Report. (abstr.): INIS Atomindex, v. 13, no. 19, p. 6901, abstract no. 700600, International Atomic Energy Agency, Vienna, Austria.
- Dean, S.L., J. Blanco, M.W. Phillips and B.R. Kulander (1985) Relationship of joint trends to aerial photograph lineaments in south-central Kentucky (abstr.): Geological Society of America, Abstracts with Programs, v. 17, n. 5, p. 284.
- Croydon, R.M. and M.W. Phillips (1986) Hydrothermal synthesis of sodium silicates (abstr.): The Ohio Journal of Science, v. 86, n. 2, p. 10.
- Watkins, M.L., S.L. Dean and M.W. Phillips (1986) Electron probe analysis of mineralized joints from the upper Beekmantown (lower Ordovician) in the northern Shenandoah Valley (abstr.): The Ohio Journal of Science, v. 86, n. 2, p. 11.
- Beverstock, D.M. and M.W. Phillips (1986) A refinement of the structure of pollucite (abstr.): The Ohio Journal of Science, v. 86, n. 2, p. 11.
- Phillips, M.W., R.K. Popp and A.A. Pinkerton (1986) Structural investigation of oxidation-dehydrogenation in hornblende (abstr.): EOS, Transactions of the American Geophysical Union, v. 67, n. 44, p. 1270.
- Phillips, M.W., R.K. Popp and C.A. Clowe (1987) Oxidation-induced changes in C2/m amphibole structures (abstr.): Geological Society of America, Abstracts with Programs, v. 19, n. 7, p. 804.
- Popp, R.K. and M.W. Phillips (1987) Accommodation of ferric iron in natural calcic and subcalcic clinoamphiboles (abstr.): Geological Society of America, Abstracts with Programs, v. 19, n. 7, p. 808.
- Phillips, M.W., R.K. Popp and A.A. Pinkerton (1988) Oxidation-induced "exsolution" of iron-oxide in grunerite (abstr.): EOS, Transactions of the American Geophysical Union, v. 69, n. 16, p. 523.



- Phillips, M.W., P.H. Ribbe and A.A. Pinkerton (1988) The structure of intermediate albite (abstr.): EOS, Transactions of the American Geophysical Union, v. 69, n. 44, p. 1506.
- Phillips, M.W., H. Zhang and H. Kroll (1988) The structure of a natural maximum microcline at 294K and 163K: The "room-temperature" phase transition revisited (abstr.): Geological Society of America, Abstracts with Programs, v. 20, n. 7, p. A225.
- Phillips, M.W., R.K. Popp and C.A. Clowe (1990) Oxidation-dehydrogenation effects in amphiboles: A comparison of grunerite and hornblende. Program for a Symposium in Honor of F. Donald Bloss, Blacksburg, Virginia, July 22-25, 1990.
- Popp, R.K., M.W. Phillips and C.A. Clowe (1990) Experimental investigation of oxidation-dehydrogenation in tschermakitic hornblende. Program for a Symposium in Honor of F. Donald Bloss, Blacksburg, Virginia, July 22-25, 1990.
- Ribbe, P.H. and M.W. Phillips (1990) Albite optics and crystal structures. Program for a Symposium in Honor of F. Donald Bloss, Blacksburg, Virginia, July 22-25, 1990.
- Phillips, M.W., R.K. Popp and S.J. Fritz (1990) Reordering of Mg/Fe in air-heated olivines. (abstr.): Geological Society of America, Abstracts with Programs, v. 22, n. 7, p. A259.
- Popp, R.K., D. Virgo, T.C. Hoering and M.W. Phillips (1992) Experimental investigation of ferric-ferrous ratios in kaersutic amphiboles (abstr.): EOS, Transactions of the American Geophysical Union, v. 73, p. 337.
- Phillips, M.W., R.K. Popp, D. Virgo, T.C. Hoering (1993) Oxidation effects on the octahedral strip of titanian paragsite (abstr.): Geological Society of America, Abstracts with Programs, v. 25, n. 6, p. A216.
- Popp, R.K., D. Virgo, T.C. Hoering, H.S. Yoder and M.W. Phillips (1993) Experimental study of oxy-component in kaersutic amphiboles (abstr.): Geological Society of America, Abstracts with Programs, v. 25, n. 6, p. A95.
- Virgo D., R.K. Popp, T.C. Hoering and M.W. Phillips, (1993) Phase equilibrium of mantle derived amphiboles: Implications for oxygen fugacity and hydrogen content of the earth's upper mantle. (abstr.): Symposium on the Evolution of the Mantle. Australian National University.
- Virgo D., E.D. Young, R.K. Popp, T.C. Hoering and M.W. Phillips (1994) The petrologic significance of exchange components in kaersutites: a statistical and experimental analysis (abstr.): Program for the Fifth Biennial Symposium of Experimental Mineralogy, Petrology and Geochemistry, London, England, April 13-15, 1994.