

## Andrew G. Stack

School of Earth and Atmospheric Sciences, Georgia Institute of Technology  
Atlanta, GA 30332-0340.

Phone: 404-894-3895, Fax: 404-894-5638, E-mail: andrew.stack@eas.gatech.edu

### Publications

- Stack, A. G.**; Rustad, J. R. (2007) Structure and dynamics of water on aqueous barium ion and the {001} barite surface. *J. Phys. Chem. C* **111**, 16387-16391.
- Rustad, J. R.; **Stack, A. G.** (2006) Molecular dynamics calculation of the activation volume for water exchange on Li<sup>+</sup>. *J. Am. Chem. Soc.* **128**, 14778-14779.
- Stack A. G.**, Rustad J. R., Casey W. H. (2005) Modeling water exchange on an aluminum polyoxocation. *J. Phys. Chem. B*, **109**, 23771-23775.
- Stack A. G.**, Rustad J. R., Land T. A., De Yoreo J. J., Thomas T. N. & Casey W. H. (2004). The growth morphology of the {100} surface of KDP (Archerite) on the molecular scale. *J. Phys. Chem. B*, **108**, 18284-18290.
- Stack A. G.**, Erni R., Browning N. D. & Casey W. H. (2004) Pyromorphite growth *in situ* on lead sulfides. *Envi. Sci. Technol.* **38**, pp. 5529-5534.
- Stack A. G.**, Eggleston C. M. & Engelhard M. H. (2004) Reaction of hydroquinone with hematite I: Electrochemical scanning tunneling microscopy and X-ray photoelectron spectroscopy. *J. Coll. Int. Sci.*, **274**, pp. 433-441.
- Stack A. G.**, Rosso K. M., Smith D. M. A. & Eggleston C. M. (2004) Reaction of hydroquinone with hematite II: Calculation of the electron transfer rate and comparison to the dissolution rate. *J. Coll. Int. Sci.*, **274**, pp. 442-450.
- Eggleston C.M., Stack A.G., Rosso K.M. & Bice A.M. (2004) Adatom Fe(III) on the hematite surface: Observation of a key reactive surface species. *Geochem. Trans.* **5**, 2, pp. 33-40.
- Eggleston C. M., Stack A. G., Rosso K. M., Higgins S. R., Bice A. M., Boese S. W., Pribyl R. D. & Nichols J. J. (2003) The structure of hematite ( $\alpha$ -Fe<sub>2</sub>O<sub>3</sub>) (001) surfaces in aqueous media: Scanning tunneling microscopy and resonant tunneling calculations of coexisting O and Fe terminations. *Geochim. Cosmochim. Acta.* **67**, 5, pp. 985-1000.

**Stack A. G., Higgins S.R. & Eggleston C.M.** (2003) Response to comment on “Point of zero charge of a corundum-water interface probed with optical second harmonic generation (SHG) and Atomic Force Microscopy (AFM): New approaches to oxide surface charge. *Geochim. Cosmochim. Acta.* **67**, 2, pp. 321-322

Higgins S. R., Stack A. G., Knauss K. G., Eggleston C. M. & Jordan G. (2002) Probing molecular scale adsorption and dissolution-growth processes using nonlinear optical and scanning probe methods suitable for hydrothermal applications. In *Water-Rock Interactions, Ore Deposits, and Environmental Geochemistry: A Tribute to David A. Crerar*, Special Publication No. 7 (ed. R. Hellmann and S. A. Wood), pp. 111-128. The Geochemical Society.

**Stack A. G., Higgins S.R. & Eggleston C.M.** (2001) Point of zero charge of a corundum-water interface probed with optical Second Harmonic Generation (SHG) and Atomic Force Microscopy (AFM): New approaches to oxide surface charge. *Geochim. Cosmochim. Acta* **65**, 18, pp. 3055-3063.

### **Conference Abstracts from Stack & Group**

**Stack, A. G.** (2008) Applications of electrochemical scanning tunneling microscopy to adsorption and thin films in geochemical systems. *American Chemical Society*, Spring 2008 National Meeting & Exposition. (invited)

**Stack, A. G.** (2008) Water structure on aqueous ions and barite-water interfaces. *American Chemical Society*, Spring 2008 National Meeting & Exposition. (invited)

**Stack, A. G.** (2008) Computational prediction of kinetics of processes at mineral-water interfaces and aqueous ions. *American Chemical Society*, Spring 2008 National Meeting & Exposition. (invited)

Zhang, M.; Dale, J. R.; DiChristina, T. J. & Stack A. G. (2007) Dissolution morphology as an indicator of the controls on respiration in *Shewanella oneidensis* MR-1. *17th Annual V. M. Goldschmidt Conference*, Cologne, Germany.

Stack A. G. & Rustad J. R. (2007) Water structure and dynamics on aqueous barium ion and the {001} barite surface. *17th Annual V. M. Goldschmidt Conference*, Cologne, Germany.

Stack A. G., Rustad J. R., Land T. A. & Casey W. H. (2004) The growth morphology of the {100} surface of KDP (Archerite) on the molecular scale. *Western Regional Section Conference on Crystal Growth and Epitaxy*, Fallen Leaf Lake, CA.

Stack A.G., Eggleston C.M. & Higgins S.R. (2002) Electrochemical STM of quinones at hematite (0001) surfaces: Adsorption of a biological electron "shuttle." In *Geochimica Cosmochimica Acta Special Supplement, Abstracts of the 12th Annual V.M. Goldschmidt conference*, Davos, Switzerland, pg. A207.

Stack A.G., Eggleston C.M. & Higgins S.R. (2001) Oxygen vs. iron termination of hematite (0001) surfaces: STM imaging in air and in aqueous solutions. In *Eleventh Annual V. M. Goldschmidt Conference*, Abstract #3824. LPI Contribution No. 1088, Lunar and Planetary Institute, Houston (CD-ROM).

Stack A.G., Higgins S.R. & Eggleston C.M. (1999) Measurements of the isoelectric pH of a single crystal face of corundum by optical second harmonic generation and atomic force microscopy. In *Abstracts of Papers of the American Chemical Society*, 217, pg. 8-GEOC.

### **Conference Symposia Organized**

"Nano-scale investigations of mineral-water interface processes." (2007) *17th Annual V. M. Goldschmidt conference*, Köln, Germany.

"Advances in experimental and theoretical methods for characterization of mineral-fluid interfaces." (2005) *15th Annual V. M. Goldschmidt conference*, Moscow, Idaho.

### **Current Funding**

U.S. National Science Foundation, Division of Earth Sciences, GeoBiology and Low-Temperature Aqueous Geochemistry program.

U.S. Department of Energy, Office of Basic Energy Sciences, Geosciences Research Program.

### **Education**

Ph.D. in Geology, December 2002 (GPA 4.00). University of Wyoming, Laramie WY.

Dissertation - Understanding iron-oxide surface structure and its interaction with quinones: Working towards a more fundamental understanding of biological influences on minerals. Advisor: Carrick M. Eggleston

M.S. in Geology, July 1999 (GPA 4.00). University of Wyoming, Laramie WY.  
Thesis - Second harmonic generation and atomic force microscopy-force distance measurements of a corundum-water interface: Point of zero charge and water structure near a charged interface. Advisor: Carrick M. Eggleston

B.S. cum laude in Geological Sciences, Geochemistry option, May 1997 (GPA 3.51).  
Virginia Polytechnic Institute, Blacksburg, VA. Undergraduate research project - Etch-pit morphology of naturally and artificially weathered silicates. Advisors: Michael F. Hochella, Jr., and J. Donald Rimstidt.

### **Professional Experience**

Assistant Professor, Georgia Institute of Technology, Atlanta, GA (2005-present).

Postgraduate Researcher, University of California, Davis (2003-present). Supervisor: William H. Casey.

Temporary Scientist Level I, Shepherd-Miller Inc., Fort Collins, CO (summer 1998).  
Supervisor: Janet A. Schramke.

Hydrologist, U.S. Geological Survey, Reston, VA (summers and breaks, 1994-1997).  
Supervisor: L. Niel Plummer.

### **Honors**

Mineralogical Society of America Undergraduate Award (1997).  
U.S. Department of Interior On-the-Spot Award (1996).

### **Professional Societies**

Member, The American Chemical Society.  
Member, The Geochemical Society.