

Peter S. Nico

Work Address:

Earth Sciences Division
Lawrence Berkeley National Lab
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Berkeley, CA 94720
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EDUCATION

Post-Doctoral Fellow	Soil and Environmental Biogeochemistry	Stanford University	2002
Doctor of Philosophy	Agricultural and Environmental Chemistry	University of California, Davis	2001
Candidate in Philosophy*	Organic Chemistry	University of California, Los Angeles	1996
Masters of Science	Organic Chemistry	University of California, Los Angeles	1996
Bachelors of Science	Chemistry	University of California, Davis	1994

RESEARCH EXPERIENCE

Geologic Scientist, Lawrence Berkeley National Laboratory *August 2005- Present*

Assistant Professor, California State University, Stanislaus *September 2002-August 2005*

Visiting Scholar, Stanford University *September 2002-Present*
Department of Geological and Environmental Sciences

Post Doctoral Fellow, Stanford University *November 2001-September 2002*
Department of Geological and Environmental Sciences
Research Director: Dr. Scott Fendorf

Research Assistant, University of California, Davis *September 1996-2001*
Department of Agricultural and Environmental Chemistry
Dissertation Advisor: Dr. Robert J. Zasoski

Research Assistant, University of California, Los Angeles *September 1994-1996*
Department of Chemistry and Biochemistry
Research Advisor: Dr. M. Fredrick Hawthorne

TEACHING EXPERIENCE

Assistant Professor, California State University, Stanislaus *September 2002-2005*

Lecturer, California State University, Hayward *Fall 2000*

Adjunct Faculty, Woodland Community College *Spring 1999*

* Candidate in Philosophy (C.Phil.) is a degree awarded by UCLA after a Ph.D. student has successfully completed his/her oral exams and has been promoted to candidacy.

Guest Lecturer; University of California, Davis

Winter 1998

Teaching Assistant; University of California, Davis and Los Angeles

1994-1997

PUBLICATIONS

- Nico, P.S.; Stewart, B.D.; Fendorf, S. E., *Environmental Science and Technology*, **2009** ASAP
“Incorporation of Oxidized Uranium into Fe(hydr)oxides during Fe(II) Catalyzed Remineralization” (LBNL-2506E)
- Stewart, B.D.; Nico, P.S.; Fendorf, S. E.; *Environmental Science and Technology*, **2009** 43(13) 4922-4927
“Stability of Uranium Incorporated into Fe(hydr)oxides Under Fluctuating Redox Conditions” (LBNL-1863E)
- Tufano, K.J.; Benner, S.G., Mayer, K.U.; Marcus, M.A.; Nico, P.S.; Fendorf, S.; **2009** *Vadose Zone Journal* “Aggregate-Scale Heterogeneity in Iron (Hydr)oxide Reductive Transformations”
- Nico, P.S.; Kumfer, B.K.; Kennedy, I.M.; Anastasio, C.; *Aerosol Sci. and Technol.*, **2009** 43(1) 60-70
“Redox Dynamics of Mixed Metal (Mn, Cr, and Fe) Ultrafine Particles” (LBNL-811E)
- Soler, J.M.; Boi, M.; Mogollón, J.L.; Cama, J., Ayora, C.; Nico, P.S.; Tamura, N.; Kunz, M.; *Applied Geochemistry* **2008**, 23, 3579-3588 “The passivation of calcite by acid mine water. Column experiments with ferric sulfate and ferric chloride solutions at pH 2” (LBNL-955E)
- Hopp, L.; Nico, P.S.; Marcus, M.A.; Peiffer, S. *Environ. Sci. and Technol.*, **2008** 42(17) 6481-6486
“Arsenic and chromium partitioning in a podzolic soil contaminated by chromated copper arsenate” (LBNL-353E)
- Niess, J.; Stewart, B.D.; Nico, P.S.; Fendorf, S.E., *Environ. Sci. and Technol.*, **2007**, 41(21) 7343-7348
“Speciation Dependent Microbial Reduction of Uranium Within Iron-coated Sands under Dynamic Flow” (LBNL-63022)
- Werner, M.L.; Nico, P.S.; Marcus, M.A.; Anastasio, C.; *Environ. Sci. and Technol.* **2007**; 41(14), 4919-4924. “Speciation of Chromium in Airborne Fine Particles in the Sacramento Valley” (LBNL-62779)
- Werner, M.; Nico, P.; Bing, G.; Kennedy, I.; Anastasio, C.; *Aerosol Sci. and Technol.* **2006**, 40(7), 545-556 “Atmospheric Transformation of Chromium in Ultrafine Combustion Aerosol Particles” (LBNL-59104)
- Nico, P.S.; Ruby, M.V.; Lowney, Y.W.; Holm, S.E.; *Environ. Sci. Technol.* **2005**, 40(1), 402-408
“Chemical Speciation and Bioaccessibility of Arsenic and Chromium in Chromated Copper Arsenate-Treated Wood and Soils” (LBNL-59097)
- Nico, P.S.; Fendorf, S.E.; Lowney, Y.W.; Holm, S.E.; Ruby, M.V.; *Environ. Sci. Technol.* **2004**, 38, 5253-5260 “Chemical Structure of Arsenic and Chromium in CCA-Treated Wood: Implications of Environmental Weathering”
- Hansel, CM; Benner, SG; Nico, P; Fendorf, S., *Geochim. Cosmochim. Acta*, **2004**, 68, 3217-3229
”Structural constraints of ferric (hydr)oxides on dissimilatory iron reduction and the fate of Fe(II)”

Nico, P.S.; Anastasio, C; Zasoski, R.J., *Geochim. Cosmochim. Acta.* **2002**, *66*, 4067-4076 “Rapid Photo-oxidation of Mn(II) Mediated by Humic Substances”

Nico, P. S.; Zasoski, R. J., *Environ. Sci. Technol.* **2001**, *35*, 3338-3343, “Mn(III) Availability as a Rate Controlling Factor in the Oxidation of Phenol and Sulfide on δ -MnO₂”

Nico, P. S.; Zasoski, R. J., *Environ. Sci. Technol.* **2000**, *34*, 3363-3367, “Importance of Mn(III) Availability on Cr(III) Oxidation on Birnessite”

BOOK CHAPTERS

B. Gilbert, C. S. Kim, C.-L. Dong, J. Guo, **P. S. Nico** and D. K. Shuh, “Oxygen K-edge emission and absorption spectroscopy of iron oxyhydroxide nanoparticles” *X-ray Absorption Fine Structure-XAFS13*, **2007**, American Institute of Physics Conference Proceedings, v882, p.51-55, Edited by B. Hedman and P. Pianetta (LBNL-62225)

A.R. Gerson, C. Anastasio, S. Crowe, D. Fowle, B. Guo, I. Kennedy, E. Lombi, **P.S. Nico**, M.A. Marcus, R.R. Martin, S.J. Naftel, A.J. Nelson, D. Paktunc, J.A. Roberts, C.G. Weisener and M.L. Werner, “Frontiers in Assessing the Role of Chemical Speciation and Natural Attenuation on the Bioavailability of Contaminants in the Terrestrial Environment,” Chapter 7 in *Chemical Bioavailability in Terrestrial Environments*, (Ed. R. Naidu) Elsevier, *Developments in Soil Science*, vol. 32, **March 2008** (LBNL-60830)

Peter S. Nico and Scott E. Fendorf, *Encyclopedia of Soils in the Environment*, “Kinetics of Redox Reactions” **2004**, p372-378, Daniel Hillel, Editor-in-Chief, Elsevier Ltd., Oxford, UK.

PROFESIONAL AFFILIATIONS

Soil Science Society of America
American Chemical Society
American Geophysical Union
EnviroSynch

COLLABORATORS:

David Sedlak, University of California, Berkeley
Markus Kelber, Oregon State Univeristy
Cort Anastasio, University of California, Davis
Ian Kennedy, University of California, Davis
Steve Cliff, University of California, Davis
Scott Fendorf, Stanford University
Bruce Ravel, Argonne National Lab
Stefan Pieffer, Universitat Bayreuth, Bayreuth, Germany
Yvette Lowney, Exponent, Boulder, Colorado

INVITED PRESENTATIONS

**A STXM/NEXAFS Investigation of the Role of Particle Composition
in Organic Matter Stabilization**
Fall Meeting American Geophysical Union, San Francisco, CA

December 2007

Synchrotron Spectromicroscopy and Biogeochemical Interfaces Oregon State University, Subsurface Biosphere Initiative SBI/IGERT, Newport, OR	<i>June 2007</i>
Chromium in atmospheric particles: speciation and redox transformations 2004 ALS' User Meeting: Annual Meeting of users of the Advanced Light Source at Lawrence Berkeley National Laboratory	<i>October 2004</i>
EXAFS Investigation of Cr and As in CCA Treated Materials 19 th Annual International Conference on Soils, Sediments and Water Special Session: CCA Treated Wood – <i>Regulations, Science and Risk Assessment</i>	<i>October 2003</i>
Atmospheric Transformation of Chromium Species on Aerosol Nano-Particles Argonne National Lab's Advanced Light Source User Seminar Series	<i>June 2003</i>
The Influence of Ferric Hydroxide Structure on Sustained Microbial Metabolism and Contaminant Transport 84 th Annual Meeting of AAAS, Pacific Division, San Francisco	<i>June 2003</i>

SERVICE

ALS Infrared Steering Committee	2008-present
Co-Chair Planning Committee: Synchrotron Environmental Science IV	2007-2008
Member, "Faculty Mentor Program"	2003-2005
Faculty Mentor Program is a program through which students who are at more of a risk of not graduating are paired with "Faculty Mentors." Mentors are available to help students with academic or non-academic issues related to their success in college.	
Member, Faculty Search Committee	2004-2005
Member, Science II Ground Breaking Presentation Committee	<i>September, 2004</i>
Coordinator, Environmental Sciences Concentration California State University, Stanislaus	2002 -present
Chair, Visiting Lecturer Search Committee Department of Chemistry, California State University, Stanislaus	2002/2003
Student Representative, Agriculture and Environmental Chemistry Graduate Group Responsibilities included planning and organizing graduate group events; specifically recruiting and scheduling student and guest faculty speakers for the group's fall and winter seminar series.	
Student Member, Ad Hoc Committee on Graduate Group Membership Committee reevaluated and amended the process by which faculty were admitted to and retained in the Agricultural and Environmental Chemistry graduate group.	
Student Representative, City of Davis/U.C. Davis Liaison Committee Committee acted as liaison between the City of Davis and the University.	
Graduate Student Association Representative, U.C. Davis Represented the graduate group at the university-wide Graduate Student Association meetings.	

Graduate Student Association Representative, UCLA Chemistry Department

Responsibilities including helping to organize an “*Alternative Careers in Chemistry*” seminar series, which showcased, among others, speakers from non-research institutions talking about their careers.

SELECTED ABSTRACTS AND PRESENTATIONS

- Multi-scale Geophysical Signatures of Biogenic Calcite and FeS Precipitation Using Rifle as a Model Site** *December 2008*
Wu, Y; Ajo-Franklin, J; Williams, K H; Hubbard, S S; Nico, P S
American Geophysical Union Annual Meeting, San Francisco
- Differentiation of organic C and N forms between density fractions: does the presence of Fe matter?** *December 2008*
Nico, P S; Hatton, P; Derrien, D; Kleber, M; Lajtha, K; Zeller, B
American Geophysical Union Annual Meeting, San Francisco
- Stability of Uranium Incorporated into Fe(hydr)oxide Structure upon Oxidation and Under Fluctuating Redox Conditions** *December 2008*
Stewart, B D; Nico, P S; Fendorf, S
American Geophysical Union Annual Meeting, San Francisco
- Visualizing Rhizosphere Soil Structure Around Living Roots** *December 2008*
Menon, M; Berli, M; Ghezzehei, T A; Nico, P; Young, M H; Tyler, S W
American Geophysical Union Annual Meeting, San Francisco
- Redox dynamics of mixed metal (Mn, Cr, and Fe) ultrafine particles** *August 2008*
Ian M. Kennedy, Cort Anastasio, Benjamin Kumfer, and Peter S. Nico
American Chemical Society Meeting, Philadelphia, PA.
- Process-level Heterogeneity Controlling the Fate of Arsenic** *August 2008*
Scott Fendorf, Benjamin Kocar, Yoko Masue-Slowey, Kate Tufano, Shawn Benner, Peter S. Nico, and Chad W. Saltikov
American Chemical Society Meeting, Philadelphia, PA.
- Redox dynamics of mixed metal (Mn, Cr, and Fe) ultrafine particles** *July 2008*
Peter S. Nico, Benjamin Kumfer, Ian M. Kennedy, and Cort Anastasio
Goldschmidt 2008, Vancouver, BC.
- Stability of Uranium Incorporated into Fe(hydr)oxide Structure Under Fluctuating Redox Conditions** *July 2008*
Brandy Stewart, Peter S. Nico, Scott Fendorf
Goldschmidt 2008, Vancouver, BC.
- A STXM/NEXAFS Investigation of the Role of Particle Composition in Organic Matter Stabilization** *December 2007*
Nico, P. S., Kleber, M, Sollins, P.
American Geophysical Union Annual Meeting, San Francisco
- Potential of visualisation methods to further our understanding of CO₂ feedback mechanisms of soil organic matter decomposition** *November 2007*
Herrmann AM, Kleber M, Nunan N, Clode PL, Stockdale EA, Murphy DV, Nico P, Ritz K

European Science Foundation: The Role of Soils in the Terrestrial Carbon Balance, Premontres Abbey, Pont a Mousson, France

STXM/NEXAFS to Investigate C and N Distribution on Fe-Bearing Mineral Particles from Density Fractions *November 2007*

Markus Kleber, Peter Nico, and Phil Sollins
SSSA Annual Meeting, New Orleans

Nitrogen on Mineral surfaces: A STXM/NEXAFS investigation *September 2007*

Kleber, M., Nico, P. and Sollins, P.
3rd International Conference on Mechanisms of Organic Matter Stabilisation and Destabilisation in Soils and Sediments, Adelaide, Australia

Chemical speciation of chromium in ambient aerosol particles *March 2007*

Peter S. Nico, Michelle Werner, Cort Anastasio, and Matthew A. Marcus,
American Chemical Society Meeting, Chicago IL.

Quantitatively describing and predicting electron balance between competitive iron and uranium reduction *March 2007*

Brandy D. Stewart, Peter S. Nico, Rich Amos, and Scott Fendorf
American Chemical Society Meeting, Chicago IL.

Environmental Science Program at Synchrotron Light Sources *April 2007*

Peter Nico, Paul Northrup, Bruce Ravel, and Sam Webb
DOE, Environmental Remediation Science Program, Spring PI meeting

In Situ Sequestration of ⁹⁰Sr and Uranium in the Vadose Zone Through Microbial Precipitation of Phosphate Minerals *April 2007*

Mark Conrad, Terry Hazen, Nicolas Spycher, Peter Nico, Eoin Brodie, Yoskiko Fujita
DOE, Environmental Remediation Science Program, Spring PI meeting

Environmental Science Program at Synchrotron Light Sources *October 2006*

Peter Nico, Paul Northrup, Bruce Ravel, and Sam Webb
Oak Ridge National Laboratory, Field Research Center Workshop

Scanning transmission X-ray microscopy (STXM) spectromicroscopy of actinide particulates *September 2006*

D. K. Shuh, Tolek Tyliczszak, and Peter S. Nico
American Chemical Society Meeting, San Francisco, CA

Chemistry and Dermal Absorption of As in Residues from Wood Preserved with Chromated Copper Arsenic (CCA) *November 2004*

Y. Lowney, R. Wester, P. Nico, S. Holm, M. Ruby
Society for Environmental Chemistry and Toxicology (SETAC)
Fourth SETAC World Congress, Portland

Chemistry and Dermal Absorption of As in Residues from Wood Preserved with Chromated Copper Arsenic (CCA) *March 2004*

Y. Lowney, R. Wester, P. Nico, S. Holm, M. Ruby
Society of Toxicology Annual Meeting, Baltimore

The Influence of Iron Biomineralization on Uranium Transport *November 2003*

Peter S. Nico, Shawn G. Benner, Scott E. Fendorf
“International Workshop on Biogeochemical Processes involving

Iron Minerals in Natural Waters' International Conference Center of the
Swiss Federal Institute of Technology (ETH Zurich) on Monte Verita, Switzerland

- EXAFS Investigation of Cr and As in CCA Treated Materials** *October 2003*
Nico, P.S., Fendorf, S.E., Lowney, Y.W., Holm, S.E., Ruby, M.V.
19th Annual International Conference on Soils, Sediments and Water Special Session:
CCA Treated Wood – *Regulations, Science and Risk Assessment*
- The Influence of Ferric Hydroxide Structure on Sustained Microbial
Metabolism and Contaminant Transport** *June 2003*
P. S. Nico, C. M. Hansel, S. G. Benner, S. E. Fendorf
84th Annual Meeting of AAAS, Pacific Division, San Francisco
- Impact of Solution Speciation on Uranium Reduction** *June 2003*
Jim Neiss, Peter Nico, Scott Fendorf
84th Annual Meeting of AAAS, Pacific Division, San Francisco
- Effects of Reductive Biomineralization of Ferric Hydroxides on
Sustained Microbial Metabolism and Contaminant Sequestration** *December 2002*
C. M. Hansel, S. G. Benner, P. S. Nico, S. E. Fendorf
American Geophysical Union Annual Meeting, San Francisco, California
- Resolving Reductive Biomineralization Pathways of Ferric Hydroxide** *November 2002*
C. M. Hansel, S. G. Benner, P. S. Nico, S. E. Fendorf
Soil Science Society of America Annual Meeting, Indianapolis, Indiana
- Rate and Mechanism of Cr(VI) Reduction on Magnetite** *November 2002*
P. S. Nico, S. E. Fendorf
Soil Science Society of America Annual Meeting, Indianapolis, Indiana
- Uranium Retention by Biogenic Magnetite** *August 2002*
P. Nico, S. Benner, S. Fendorf
Symposium: Biogenic Substances and their Effect on Trace Metal Cycling and Mineral Weathering
2002 Goldschmidt, Davos, Switzerland
- Biogenic Evolution of Microscale Heterogeneity: Impact on Contaminant Dynamics** *August 2002*
S. Fendorf, C. Hansel, S. Benner, P. Nico, K. Reville, & B. Bostick
Symposium: Small-scale Processes in Heterogeneous Environments with Relevance to
Environmental Biogeochemistry
2002 Goldschmidt, Davos, Switzerland
- Reactive Pathways for the Reductive Stabilization of Metal Contaminants** *April 2002*
Scott Fendorf, Colleen Hansel, Shawn Benner, Peter Nico, and Bruce Wielinga
Symposium: Microbially Mediated Redox Process at the Solid-Water Interface
American Chemical Society National Meeting, Orlando, Florida
- Rapid Photo-oxidation of Mn(II) Mediated by Humic Substances** *April 2002*
Peter S. Nico, Cort Anasasio, Robert J. Zasoski
Symposium: Microbially Mediated Redox Process at the Solid-Water Interface
American Chemical Society National Meeting, Orlando, Florida
- Indirect Photooxidation of Mn(II)** *December 2000*
Peter S. Nico, Robert J. Zasoski
PacifiChem (co-sponsored: American Chemical Society and Japanese

Chemical Society), Waikiki

Importance of Mn(III) to Several Redox Reactions at the Birnessite Surface

March 2000

Peter S. Nico, Robert J. Zasoski

American Chemical Society National Meeting, San Francisco

Importance of Mn(III) Availability on Cr(III) Oxidation by Birnessite

August 1999

Peter S. Nico, Robert J. Zasoski

American Chemical Society National Meeting, New Orleans