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Web of Science Researcher ID: E-3182-2010 h-index: 28

Education

Nov 2012	Leadership Program	UC-Berkeley Center for Executive Education
July 2000	Ph.D. Physics	École Polytechnique Fédérale de Lausanne
June 1994	BA (Hons) Natural Sciences (Physics)	Cambridge University

Awards

2013 Best Research Award from a National Lab at the DOE 2013 Geosciences Symposium
2010 Mineralogical Society of America Early Investigator award
1999 Aladdin Lamp Award from the UW-Madison Synchrotron Radiation Center

Current Positions

Staff Scientist, Lawrence Berkeley National Laboratory (LBNL)
Professeur Invité, Grenoble University
Discovery Geosciences Program Domain Lead
BES Geochemistry Program Lead

Previous Positions

Scientist	Lawrence Berkeley National Laboratory	10/04 – 3/10
Postdoc	University of California – Berkeley	2/02 – 9/04
Postdoc	University of Wisconsin – Madison	6/00 – 1/02
Grad student	Ecole Polytechnique de Lausanne	8/96 – 6/00
Consultant	Neotronix, UK	9/95 – 7/96
Researcher	University of Cambridge	2/95 – 8/95

Current Funding

The Effect of Salinity on Geochemical Processes in Confined Aqueous Fluids
B. Gilbert (Lead PI, 8 co-PIs)
DOE Basic Energy Sciences (Geochemistry) 3Yr (2015-17) $1.6M per year ($260k to B.G.)

The Mechanism of Fumarate Photoreduction on ZnS Nanoparticles
J. Banfield (PI), B. Gilbert & T. Cuk
National Science Foundation (Low-Temperature Geochemistry), 3Yr (2014-16) $300k per year

Center for Nanoscale Controls on Geologic CO_2
D. DePaolo (PI), B. Gilbert & co-PIs
DOE Basic Energy Sciences (EFRC) 4Yr (2015-18) $3.4M ($275k to B.G. per year)

LBNL Sustainable Systems Scientific Focus Area 2.0
S. Hubbard (PI) & co-PIs
DOE Biological and Environmental Research, 3 Yr (2015-2017) ($180k to B.G. per year)

High-Pressure Soft-X-ray (HP-SX) Fluid Cells
J. Guo (PI), B. Gilbert & co-PIs
Laboratory Directed Research and Development proposal, 2Yr (2014-16) $160k

The Cytotoxicity of Imogolite and Ge-Imogolite Protected Silver Nanowires
B. Gilbert (PI) and L. Charlet
the French SERENADE network, 2 Yr (2015-2016) €40K.

NanoWIR^{2}ES : *NanoWire Intelligent Re-design and Recycling for Environmental Safety*
A. Hofmann (PI), B. Gilbert & co-PIs in US, France and Spain.
EU SIINN Call, 3 Yr (2016-2019) approximately $300K in the US and €290 in Europe.

Teaching

Conductive and Redox Active Minerals
Undergraduate Class, Mineralogy 100A, Earth & Planetary Sciences, UC-Berkeley. Course given by Prof. J. Banfield. Berkeley. Classes: Nov 18, 2013, Nov 8, 2014. Nov 16, 2015.

Natural and Engineered Nanoparticles in the Environment.
Graduate Class, Dept. Environmental Science Policy and Management, UC-Berkeley. Course given by Prof. C. Palud. Berkeley, CA, September 11, 2010.

Mentoring

Graduate Students - current

Tyler Arbour	University of California – Berkeley (Prof. Jill Banfield) *Thermodynamic controls on dissimilatory iron reduction*
Ellen Daugherty	Colorado State University (Prof. Thomas Borch) *Iron(II) complexation by natural organic matter*
Francesco Marrafatto	University of Lausanne (Prof. J. Pena) *The mechanism of birnessite photoreduction*

Graduate Students - previous

David Mangiante	PhD. 2016	University of California – Berkeley (Prof. Jill Banfield) *The mechanism of fumarate photoreduction by ZnS nanoparticles*
Jennifer Soltis	PhD. 2015	University of Minnesota (Prof. R. L. Penn) *Ultrafast pump-probe studies of electron mobility in iron oxides*
Ben Legg	PhD. 2015	University of California – Berkeley (Prof. Jill Banfield) *Nucleation and aggregation of iron oxyhydroxides*
Jessica Ray	PhD. 2015	University of Washington at St. Louis (Prof. Y.-S. Jun) *Geochemistry of iron oxyhydroxides nanoparticles*
Leona Scanlan	PhD. 2013	University of California – Berkeley (Prof. Chris Vulpe) *Toxicity of silver nanowires to* Daphnia magna
Carmen Goodell	MSc. 2007	University of California – Berkeley (Prof. Jill Banfield) *Surface structure of ZnS nanoparticles*

Postdoctoral scholars

Current: Namhey Lee (LBNL); Aurelie Chagneau (LBNL)

Previous: Chantel Tester (LBNL); Eunju Kim (LBNL); Jordan E. Katz (Denison University); Menquang (Mike) Zhu (Bozeman University)

Miscellaneous Scholarly Activities

Reviewer for funding agencies (DOE BES–Geochemistry, NSF–Low Temperature Geochemistry), journals (*Science*, *GCA*, *ES&T, etc.*) synchrotrons (ALS, SSRL and Canadian Light Source).

Assistant Editor, American Mineralogist 2013.

Participant in Workshops: "DOE-BES Roundtable on Foundational Subsurface Research", May 22, 2015; "NSF Nanotechnology Infrastructure Workshop", April 3-4, 2012; "NSF Nanomaterials and the Environment: The Chemistry and Materials Perspective", June 28-29, 2011.

Publications

h-index: 28 (10th Dec 2015).

Total number of articles: 71; Sum of citations: 3420; Citations per article: 52.

Submitted or in press

78. C. Tester, S. Aloni, B. Gilbert and J. F. Banfield.
Short- and long-range attractive forces that influence the structure of montmorillonite osmotic hydrates.
resubmitted ***Langmuir***.

Published

78. B. Gilbert and G. A Waychunas
The timescales of mineral redox reactions. Chapter 5 in In I. Ahmed, and K. Hudson-Edwards, Eds. Redox reactive minerals: Properties, reactions and applications in clean technologies, ***European Mineralogical Union Notes in Mineralogy*** *Vol 18*.

77. N. J. Bouskill, T. E. Wood, R. Baran, Z. Hao, Z. Ye, B. P. Bowen, H.-C. Lim, P. S. Nico, H.-Yi. Holman, B. Gilbert, W. L Silver, T. R. Northen, and E. L. Brodie.
Belowground response to drought in a tropical forest soil. II. Change in microbial function impacts carbon composition.
Frontiers in Microbiology 7, 323, 1 – 13 (2016).

76. P. Zarzycki and B. Gilbert.
Long-range interactions restrict water transport in smectite interlayers.
Scientific Reports 6, (2016).

75. B. Gilbert, L. R. Comolli, R. M. Tinnacher, Kunz, M. and J. F. Banfield.
Formation and restacking of disordered osmotic hydrates of smectite.
Clays and Clay Minerals 63, 432-442 (2015).

74. J. Soltis, J. M. Feinberg, B.. Gilbert and R. L. Penn.
Phase Transformation and Particle-Mediated Growth in the Formation of Hematite from 2-Line Ferrihydrite.
Crystal Growth and Design 16, 922-932 (2015).

73. E. Roth, B. Gilbert and D. Mays.
Colloid deposit morphology and clogging in porous media: Fundamental insights through investigation of deposit fractal dimension.
Environmental Science & Technology 49, 12263-12270 (2015).

72. Roth, E.J., M. Mont-Eton, B. Gilbert, T.C. Lei, and D.C. Mays.
Measurement of colloidal phenomena during flow through refractive index matched porous media.
Review of Scientific Instruments 86, 113103 (2015).
71. F. F. Marafatto, M. L. Strader, J. Gonzalez-Holguera, A. Schwartzberg, B. Gilbert, Jasquelin Peña
Rate and mechanism of the photoreduction of birnessite (MnO_2) nanosheets.
PNAS 112, 4600-4605 (2015).
70. N. Lee, P. J. Schuck, P. S. Nico and B. Gilbert,
Surface enhanced Raman spectroscopy of adsorbates on magnetite (Fe_3O_4) nanoparticles.
Journal of Physical Chemistry Letters 6, 970-974 (2015).
69. B. A. Legg, M. Zhu, L. R. Comolli, B. Gilbert and J. F. Banfield.
Impacts of ionic strength on three dimensional nanoparticle aggregate structure and consequences for environmental transport and deposition.
Langmuir 30, 9931-9940 (2014).
68. R. M. Silva, J. Xu, C. Saiki, D. S. Anderson, L. M. Franzi, C. D. Vulpe, B. Gilbert, L. S. Van Winkle & K. E. Pinketon.
Short versus long silver nanowires: A comparison of in vivo *pulmonary effects post instillation.*
Particle and Fibre Toxicology 11, 1-20 (2014).
67. B. A. Legg, M. Zhu, L. R. Comolli, B. Gilbert and J. F. Banfield.
Determination of the three-dimensional structure of ferrihydrite nanoparticle aggregates.
Langmuir 30, 9931-9940 (2014).
66. B. Gilbert, J. J. Erbs, R. L. Penn, V. Petkov, D. Spagnoli & G. A. Waychunas.
A disordered nanoparticle model for 6-line ferrihydrite.
American Mineralogist 98, 1465-1476 (2013).
65. C. Frandsen, B. Legg, L. Comolli, H. Zhang, B. Gilbert, E. Johnson and J. F. Banfield.
Aggregation-induced growth and transformation of β-FeOOH nanorods to micron-sized α-Fe_2O_3 spindles.
CrystEngComm 16, 1451-1458 (2014).
64. L. D. Scanlan, R. B. Reed, A. V. Loguinov, P. Antczak, A. Tagmount, S. Aloni, D. Nowinskia, P Luong, C. Tran, N. Karunaratne, D. Q. Pham, X.-X. Lin, F. Falciani, C. P. Higgins, J. F. Ranville, C. D. Vulpe and B. Gilbert
Silver nanowire exposure results in internalization and toxicity to Daphnia magna
ACS Nano 7, 10681-10694 (2013).
63. B. Gilbert, J.E. Katz, N. Huse, C. Frandsen, R.W. Falcone and G.A. Waychunas.
Ultrafast electron and energy transfer in dye-sensitized iron oxide nanoparticles.
Phys Chem Chem Phys 15, 17303 (2013).
62. J.R. Ray, W. Wan, B. Gilbert and Y.-S. Jun.
Effects of formation conditions the physico-chemical properties, aggregation, and phase transformation of iron oxide nanoparticles.
Langmuir 29, 1069-1076 (2013).
61. B. Gilbert, J. E. Katz, B. Rude, T. E. Glover, M. P. Hertlein, C. Kurz and X. Zhang.
Thin water film formation on metal oxide crystal surfaces.
Langmuir 28, 14308-14312 (2012).
60. J.E. Katz, X. Zhang, K. Attenkofer, K. Chapman, C. Frandsen, P. Zarzycki, K. M. Rosso, R. W. Falcone, G. A. Waychunas and B. Gilbert.
Electron small polarons and their mobility in iron (oxyhydr)oxide nanoparticles.
Science 337, 1200-1203 (2012).

59. M. Zhu, B. Legg, H. Zhang, B. Gilbert, Y. Ren, J. F. Banfield and G. A. Waychunas.
Early-stage formation of iron oxyhydroxides during neutralization of simulated acid mine drainage solutions.
Environ. Sci. Technol. 46, 8140-8147 (2012).

58. B. Gilbert, S. Fakra, T. Xia, S. Pokhrel, L. Madler & A. Nel.
The fate of ZnO nanoparticles administered to human bronchial epithelial cells.
ACS Nano 6, 4921-4930 (2012).

57. D.C. Mays, O. Cannon, A. Kanold, K. Harris, T. Lei and B. Gilbert.
Static light scattering resolves colloid structure in index-matched porous media.
Journal of Colloid and Interface Science 363, 418-424 (2011).

56. B. Gilbert, J. E. Katz, J. D. Denlinger, Y. Ying, R. W. Falcone and G. A. Waychunas.
Soft X-ray spectroscopy study of the electronic structure of oxidized and partially-oxidized magnetite nanoparticles.
Journal of Physical Chemistry C 114, 21994-22001 (2010).

55. J.E. Katz, B. Gilbert, X. Zhang, K. Attenkofer, R. W. Falcone and G. A. Waychunas.
Observation of transient iron(II) formation in dye-sensitized iron oxide nanoparticles by time-resolved X-ray spectroscopy.
Journal of Physical Chemistry Letters 1, 1372-1376 (2010).

54. S. George, S. Pokhrel, T. Xia, B. Gilbert, Z. Ji, M. Schowalter, A. Rosenauer, R. Damoiseaux, K. A. Bradley, L. Mädler and A. E. Nel
Use of a rapid cytotoxicity screening approach to engineer a safer zinc oxide nanoparticle through iron doping.
ACS Nano 4, 15-29 (2010).

53. B. Gilbert, R. K. Ono, K. A. Ching and C. S. Kim.
The effects of nanoparticle aggregation processes on aggregate structure and metal uptake.
Journal of Colloid and Interface Science 339, 285-295 (2009).

52. D. Spagnoli, B. Gilbert, G. A. Waychunas and J. F. Banfield.
Prediction of the effects of size and morphology on the structure of water around hematite nanoparticles.
Geochim. Cosmochim. Acta 73, 4023-4033 (2009). *Editor's Choice* Science May 22nd 2009.

51. B. Gilbert, C. Frandsen, E. Maxey and D. M. Sherman.
Band-gap measurements of bulk and nanoscale hematite by soft x-ray spectroscopy
Physical Review B 79, 035108 (2009).

50. T. Xia, M. Kovochich, M. Liong, L. Madler, B. Gilbert, H. Shi, J. I. Yeh, J. I. Zink & A. E. Nel.
Comparison of the mechanism of toxicity of zinc oxide and cerium oxide nanoparticles based on dissolution and oxidative stress properties.
ACS Nano 2, 2121-2134 (2008).

49. Y. Politi, R. A. Metzler, M. Abrecht, B. Gilbert, F. Wilt, I. Sagi, L. Addadi, S. Weiner and P.U.P.A. Gilbert
Mechanism of transformation of amorphous calcium carbonate into calcite in the sea urchin larval spicule.
PNAS 105, 17362 (2008).

48. J. J. Erbs, B. Gilbert and R. L. Penn.
Influence of size on reductive dissolution of six-line ferrihydrite
Journal of Physical Chemistry B 112, 12127-12133 (2008).

47. G. Q. Ren, Z. Lin, B. Gilbert, J. Zhang, F. Huang and J. K. Liang.
Evolution of ZnS nanostructure morphology under interfacial free-energy control
Chemistry of Materials 20, 2438-2443 (2008).

46. J. Cervini-Silva, B. Gilbert, S. Fakra, S. Freidlich and J. F. Banfield.
Decarboxylation and polymerization of catechol and formation of CeO_2 due to coupled redox and dissolution reactions at the surface of cerium(III) phosphate
Geochim. et Cosmochim. Acta 72, 2454-2464 (2008).
45. B. Gilbert
Finite size effects on the real-space pair distribution function of nanoparticles
Journal of Applied Crystallography 41, 554-562 (2008).
44. C. Goodell, B. Gilbert, S. Weigand, H. Zhang and J. F. Banfield
The kinetics of the water adsorption driven structural transformation of ZnS nanoparticles
Journal of Physical Chemistry C 112, 4791-4796 (2008).
43. J. W. Moreau, P. K. Weber, M. C. Martin, B. Gilbert, I. D. Hutcheon and J. F. Banfield
Extracellular proteins limit the dispersal of biogenic nanoparticles
Science 316, 1600-1603 (2007).
42. B. Gilbert, G. Lu and C. S. Kim.
Stable cluster formation in aqueous suspensions of iron oxyhydroxide nanoparticles.
Journal of Colloid and Interface Science 313, 152-159 (2007).
41. 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-XAFS 13*. Edited by B. Hedman and P. Pianetta, American Institute of Physics Conference Proceedings, Volume 882, X-Ray Absorption Fine Structure - XAFS13: 13th International Conference, Stanford, California (USA), 9-14 July 2006, p. 51-55 (2007).*
40. B. Chen, B. Gilbert, H. Zhang and J. F. Banfield.
Mechanism of inhibition of nanoparticle growth and phase transformation by surface impurities.
Physical Review Letters 98, 106103 (2007).
39. B. Gilbert, H. Zhang, B. Chen, M. Kunz, F. Huang, and J. F. Banfield.
The compressibility of zinc sulfide nanoparticles
Physical Review B 74, 115405 (2006).
38. Z. Lin, B. Gilbert, Q. Liu, F. Huang.
A thermodynamically stable nanophase material.
Journal of the American Chemical Society 128, 6126-6131 (2006).
37. B. Gilbert, F. Huang, Z. Lin, C. Goodell, H. Zhang, and J. F. Banfield
Surface chemistry controls crystallinity of ZnS nanoparticles
Nanoletters 6, 605-610 (2006).
36. H. Zhang, B. Chen, B. Gilbert, and J.F. Banfield.
Kinetically controlled formation of a novel nanoparticulate ZnS with mixed cubic and hexagonal stacking
Journal of Materials Chemistry 16, 249-254 (2006).
35. B. Gilbert and J. F. Banfield.
Molecular-scale processes involving nanoparticulate minerals in biogeochemical systems
Reviews in Mineralogy and Geochemistry 59, 109-155 (2005).
34. Gelsomina De Stasio, et al.
Are gadolinium contrast agents suitable for gadolinium neutron capture therapy?
Neurological Research 27, 387-398 (2005).
33. B. Gilbert, F. Huang, H. Zhang, G. A. Waychunas and J.F. Banfield.
Nanoparticles: Strained and Stiff.
Science 305, 651-654 (2004).

32. B. Gilbert, F. Huang, H. Zhang, Y. Ren, D. Haskel, J. C. Lang, G. Srajer, Astrid Jürgenssen, Glenn Waychunas and J. F. Banfield.
Analysis and simulation of a nanoparticle structures observed in a surface-driven transition.
Journal of Chemical Physics 120, 11785 (2004).
31. F. Huang, B. Gilbert, H. Zhang and J. F Banfield.
Reversible, surface-controlled structure transformation in nanoparticles induced by aggregation-disaggregation.
Physical Review Letters 92, 155501, (2004).
30. H. Zhang, F. Huang, B. Gilbert and J. F. Banfield.
Molecular dynamics simulations, thermodynamic analysis and experimental study of phase stability of zinc sulfide nanoparticles.
Journal of Physical Chemistry B 107, 13051 -13060, (2003).
29. B. Gilbert, H. Zhang, F. Huang, M. P. Finnegan, G. A. Waychunas, and J. F. Banfield.
Special phase transformation and crystal growth pathways observed in nanoparticles
Geochemical Transactions 4, 20-27, (2003).
28. H. Zhang*, B. Gilbert*, F. Huang, and J. F. Banfield.
* equal contributors.
Water-driven transformation of nanoparticle structure at room temperature.
Nature 424, 1025-1029, (2003).
27. B. H. Frazer, B. Gilbert, B. R. Sonderegger and G. De Stasio.
The probing depth of total electron yield in the sub keV range: TEY-XAS and X-PEEM.
Surface Science 537, 161-167, (2003).
26. G. De Stasio, B. H. Frazer, B. Gilbert, K. L. Richter and J. W. Valley.
Compensation of charging in X-PEEM: a successful test on mineral inclusions in 4.4 Ga old zircon.
Ultramicroscopy 98, 57-62 , (2003).
25. B. Gilbert, B.H. Frazer, A. Belz, P. Conrad, K. Nealson, D. Haskel, J.C. Lang, G. Srajer and G. De Stasio.
Multiple scattering calculations of bonding and X-ray absorption spectroscopy of manganese oxides.
Journal of Physical Chemistry A 107, 2839-2847, (2003).
24. B. Gilbert, B. H. Frazer, F. Naab, J. Fournelled, J.W. Valley and G. De Stasio.
X-ray absorption spectroscopy of silicates for in situ, sub-micrometer mineral identification.
American Mineralogist 88, 763–769, (2003).
23. K. Masenelli-Varlota, M. Kasrai, G.M. Bancroft, G. De Stasio, B. Gilbert, E.S. Yamaguchi and P.R. Ryason.
Spatial distribution of the chemical species generated under rubbing from ZDDP and dispersed potassium triborate.
Tribology Letters 14, 157-166, (2003).
22. B. Gilbert, B. H. Frazer, H. Zhang, F. Huang, J. F. Banfield, D. Haskel, J. C. Lang, G. Srajer and G. De Stasio.
X-ray absorption spectroscopy of the cubic and hexagonal polytypes of zinc sulfide.
Physical Review B 66, 245205, (2002).
21. B.H. Frazer, B.R. Sonderegger, B. Gilbert, K.L. Richter, C. Salt, L. Wiese, D. Rajeshf, S.P. Howard, J.F. Fowler, M. P. Mehta and G. De Stasio.
Mapping of Physiological and Trace elements with X-PEEM.
Journal de Physique IV *104*, 349-352 (2003).
20. B.H. Frazer, B. Gilbert, and G. De Stasio.
X-ray absorption microscopy of aqueous samples.
Rev. Sci. Instrum. 73, 1373, (2002).

19. G. De Stasio, P. Casalbore, R. Pallini, B. Gilbert, F. Sanita, M.T. Ciotti, G. Rosi, A. Festinesi, L.M. Larocca, A. Rinelli, D. Perret, D.W. Mogk, P. Perfetti, M.P. Mehta and D. Mercanti.
Gadolinium in human glioblastoma cells for gadolinium neutron capture therapy.
Cancer Research 61, 4272-4277, (2001).
18. M. Labrenz, G.K. Druschel, T. Thomsen-Ebert, B. Gilbert, S.A. Welch, K.M. Kemner, G.A. Logan, R.E. Summons, G. De Stasio, P.L. Bond, B. Lai, S.D. Kelly, and J.F. Banfield.
Sphalerite (ZnS) deposits forming in natural biofilms of sulfate-reducing bacteria.
Science 290, 1744-1747 (2000).
17. G. De Stasio, B. Gilbert, B.H. Frazer, K.H. Nealson, P.G. Conrad, V. Livi, M. Labrenz and J.F. Banfield.
The multidisciplinarity of spectromicroscopy: from geomicrobiology to archaeology.
J. Elec. Spec. Rel. Phenom. 114 997-1003, (2001).
16. B. Gilbert, G. Margaritondo, S. Douglas, K.H. Nealson, R.F. Egerton, G. Rempfer and G. De Stasio.
X-ray microspectroscopy of biominerals with photoconductive charge compensation.
J. Elec. Spec. Rel. Phenom. 114 1005-1011, (2001).
15. B. Gilbert, G. Margaritondo, D. Mercanti, P. Casalbore and G. De Stasio.
Synchrotron spectromicroscopy in medicine and biology.
J. Alloys and Compounds 328, 8-13 (2001).
14. B. Gilbert, L. Perfetti, R. Hansen, D. Mercanti, M. T. Ciotti, P. Casalbore, R. Andres, P. Perfetti, G. Margaritondo and Gelsomina De Stasio.
UV/Ozone ashing for spatially resolved trace element analysis.
Frontiers in Bioscience 5, 10-17, (2000).
13. B. Gilbert, M. Neumann, S. Steen, D. Gabel, R. Andres, P. Perfetti, G. Margaritondo and Gelsomina De Stasio.
Immunohistochemistry for the MEPHISTO X-PEEM.
Proceedings of X-Ray Microscopy and Microanalysis XRM99, Berkeley CA, August 2-6, (1999).
12. B. Gilbert, R. Andres, P. Perfetti, G. Margaritondo, G. Rempfer and Gelsomina De Stasio.
Charging Phenomena in PEEM imaging and spectroscopy.
Ultramicroscopy 83, 129-139, (2000).
11. G. De Stasio, B. Gilbert, T. Nelson, R. Hansen, J. Wallace, D. Mercanti, M. Capozi, P. A. Baudat, P. Perfetti, G. Margaritondo and B. P. Tonner.
Transmission spectromicroscopy in the water window: a feasibility test with the MEPHISTO system.
Rev. Sci. Instrum. 71, 11-14, (2000).
10. B. Gilbert, L. Perfetti, O. Fauchoux, J. Redondo, P.-A. Baudat, R. Andres, M. Neumann, S. Steen, D. Gabel, Delio Mercanti, M. Teresa Ciotti, P. Perfetti, G. Margaritondo, and Gelsomina De Stasio.
The spectromicroscopy of boron in human glioblastomas following administration of BSH.
Phys. Rev. E. 62, 1110-1118, (2000).
9. J. N. Cutler, J. H. Sanders, P. J. John, G. De Stasio, B. Gilbert and K. Tan.
Chemical characterization of antiwear films generated by tris-[p-(perfluoroalkylether)phenyl] phosphine using x-ray absorption spectroscopy.
Wear 236, 165-178, (1999).
8. G. W. Canning, M. L. Suominen Fuller, G. M. Bancroft, M. Kasrai, J.N. Cutler, G. De Stasio and B. Gilbert.
Spectromicroscopy of tribological films from engine oil additives: Part I: Films from ZDDP's.
Tribology Letters 6, 159-169, (1999).

7. D. N. McIlroy, Daqing Zhang, Robert M. Cohen, J. Wharton, Yongjun Geng, M. Grant Norton, Gelsomina De Stasio, B. Gilbert, Luca Perfetti, J. H. Streiff, B. Broocks and Jeanne L. McHale.
Electronic and dynamic studies of boron carbide nanowires.
Phys. Rev. B. 60, 4874-4879, (1999).
6. G. De Stasio, L. Perfetti, B. Gilbert, O. Fauchoux, M. Capozi, P. Perfetti, G. Margaritondo and B. P. Tonner.
The MEPHISTO spectromicroscope reaches 20 nm lateral resolution.
Rev. Sci. Instrum. 70, 1740-1742, (1999).
5. G. De Stasio, B. Gilbert, L. Perfetti, R. Hansen, D. Mercanti, M. T. Ciotti, R. Andres, V. E. White, P. Perfetti and G. Margaritondo.
Cell ashing for trace element analysis: a new approach based on UV/Ozone.
Anal. Biochem. 266, 174-180, (1999).
4. G. De Stasio, B. Gilbert, L. Perfetti, T. Nelson, M. Capozi, P. A. Baudat, F. Cerrina, P. Perfetti, B. P. Tonner and G. Margaritondo.
Soft-X-ray transmission photoelectron spectromicroscopy with the MEPHISTO system.
Rev. Sci. Instrum. 69, 3106-3108, (1998).
3. G. F. Lorusso, G. De Stasio, B. Gilbert, D. Perret, P. Perfetti, G. Margaritondo, P. Casalbore, M. T. Ciotti, L. Milazzo and D. Mercanti.
High sensitivity quantitative analysis of cobalt uptake in rat cerebellar granule cells with and without excitatory amino acids.
Neuroscience Letters 248, 9-12, (1998).
2. B. Gilbert, J. Redondo, P-A. Baudat, G. F. Lorusso, R. Andres, E. G. Van Meir, M-F. Hamou, T. Suda, D. Mercanti, M. T. Ciotti, T. C. Droubay, B. P. Tonner, P. Perfetti, G. Margaritondo and G. De Stasio.
Spectromicroscopy of boron for the optimization of boron neutron capture therapy (BNCT) for cancer.
Journal of Physics D 31, 2642-2647, (1998).
1. G. De Stasio, B. Gilbert, R. Andres, G. F. Lorusso, J. Redondo, E. G. Van Meir, J.-F. Brunet, T. C. Droubay, B. P. Tonner, D. Mercanti, M. T. Ciotti, T. Suda, P. Perfetti and G. Margaritondo.
Synchrotron spectromicroscopy for microchemical analysis of boron in rat brain tumor treated with BSH.
in "Advances in Neutron Capture Therapy", B. Larsson, J. Crawford And R. Weinreich Eds., Elsevier, Amsterdam, 321-325, (1997).

Talks

Presentations Available Online

2. Grand Seminaire, Institut des Sciences de la Terre, University of Grenoble, France
Geochemical Reaction Intermediates in Metal Redox Cycling
Grenoble, January 26, 2015
http://isterre.fr/seminaires/grands-seminaires-isterre/podcasts/article/benjamin-gilbert

1. The 2010 Chinese-American Kavli Frontiers of Science Symposium
Environmental Nanomaterials.
Shenzhen, China, November 5-6, 2011.
http://kavli.nasmediaonline.org/cafos11/gilbert_benjamin/gilbert_benjamin.html

Colloquia and Seminars

13. Seminar, Max Planck Institute of Colloids and Interfaces
    The Structure of Disordered Smectite
    Berlin, Germany, August 24, 2015
12. Grande Séminaire, ISTerre, University of Joseph Fourier
    Geochemical Reaction Intermediates in Metal Redox Cycling
    Grenoble, France, February 26, 2015
11. Colloquium, Earth and the Environment, University of Michigan, Ann Arbor
    Geochemical Reaction Intermediates in Metal Redox Cycling
    Ann Arbor, MI, January 13, 2015
10. Chemistry Colloquium, Chemistry Department, Temple University
    Geochemical Reaction Intermediates in Metal Redox Cycling
    Philadelphia, PA, November 13, 2014
9. Student Seminar Series, Chemistry Department, University of Minnesota
    Ultrafast Pump-probe Studies of Mineral Redox Reactions
    Minneapolis, MN, February 25, 2014
8. Colloquium, Pacific Northwest National Laboratory.
    Ultrafast Pump-probe Studies of Geochemical Reactions.
    Richland, WA, July 30, 2013.
7. Colloquium, Center for the Environmental Implications of Nanotechnology, Duke University.
    Distinguishing nanomaterial and metal ion contributions to nanotoxicity: Zinc oxide nanoparticles and silver nanowires.
    Durham, NC, Oct 11, 2012.
6. Colloquium, Ohio Health & Science University.
    Conventional and Pump-Probe Kinetic Studies of the Redox Chemistry of Iron (Oxyhydr)oxide Nanoparticles.
    Beaverton, OR, April 22, 2011.
5. Seminar, Molecular Foundry, LBNL.
    Nanosecond Time-Resolved X-ray Spectroscopy Studies of Photoinitated Electron Transfer to Iron Oxide Nanoparticles.
    Berkeley, CA, September 14, 2010.
4. Departmental Colloquium, Earth & Planetary Sciences, UC-Berkeley.
    Addressing the nanoparticle challenge to mineralogy and geochemistry.
    Berkeley, CA, January 22, 2009.
3. Geosciences Seminar, Virginia Tech.
    Progress in understanding the geochemical reactivity of ferric iron (oxyhydr)oxide nanoparticles.
    Blacksburg, VA, September 7, 2008.
2. Chapman University Natural Sciences Seminar
    Size effects on the geochemistry of ferric iron oxide and oxyhydroxide nanoparticles
    Orange, CA, December 4, 2006.
1. R. W. Herb Material Physics Seminar.
    Nanoparticles as dynamic systems.
    UW-Madison, WI, February 1, 2005.

Invited Presentations at International Conferences

39. The 24th V. M. Goldschmidt Conference
The Photoreduction of δ-MnO_2 Nanosheets.
Grenoble, August 19, 2015.
38. Journée Scientifique: Nanoparticules métalliques, biologie, environment et santé.
The stability, environmental toxicity and cytotoxicity of silver nanowires.
Grenoble, January 28, 2015.
37. Telluride Workshop on Biochemistry and Redox Transformations of Iron.
Iron(II) Interactions with Natural Organic Matter.
Telluride, August 5-8, 2014.
36. Synchrotron Environmental Science VI.
Structural and Chemical Studies of the Pyrite (001) Surface.
Argonne National Laboratory, September 11-12, 2014.
35. The 23rd V. M. Goldschmidt Conference.
(Keynote) *Ultrafast Pump-Probe Studies of Geochemical Reactions.*
Florence, Italy, August 28, 2013.
34. Workshop on Redox-Active Minerals prior to Goldschmidt Conference.
The Timescales of Mineral Redox Reactions.
Florence, Italy, August 26, 2013.
33. DOE BES Geosciences Symposium
A disordered whole-nanoparticle model for 6-line ferrihydrite
Gaithersberg, March 15, 2013.
32. Monte Verita Conference on Iron Biogeochemistry
Insights into Iron Oxide Redox Reactions revealed by Ultrafast Time-resolved Spectroscopy.
Monte Verita, Switzerland, March 5, 2013.
31. Workshop on environmental science at the SSRL User's Meeting
Combined Pb Sorption and X-ray Diffraction Studies of the Hydrated Pyrite (001) Interface.
Stanford, October 4, 2012.
30. The 22st V. M. Goldschmidt Conference.
Structural and Chemical Studies of the Pyrite (001) Surface.
Montreal, Canada, June 18, 2012.
29. DOE BES Geosciences Symposium
Mineralogical constraints on redox reactions of iron (oxyhydr)oxide phases
Gaithersberg, September 9, 2011.
28. COSMIC at the ALS: New Frontiers in Soft X-Ray Coherent Scattering and Imaging
X-ray Microscopy and Spectromicroscopy needs for Environmental and Human Nanotoxicology
Berkeley, August 2, 2011.
27. Workshop on high repetition rate ultrafast science at the SSRL User's Meeting
Origin of the differences in redox reactivity of iron (oxyhydr)oxides revealed by time-resolved spectroscopy
Stanford, October 22, 2011.
26. Workshop on Time-Resolved X-ray Science at ALS User's Meeting
Time-resolved Geochemistry
Berkeley, October 5, 2011.
25. The 21st V. M. Goldschmidt Conference.
Origin of the differences in redox reactivity of iron (oxyhydr)oxides revealed by time-resolved spectroscopy.
Prague, Czech Republic, August 18, 2011.

24. Geochemical Society of America Annual Meeting.
MSA Award Lecture: Addressing the nanoparticle challenge to mineralogy and geochemistry.
Denver, CO, Nov 2, 2010.
23. The 20th V. M. Goldschmidt Conference.
Observing iron redox dynamics at the nanosecond scale with time-resolved x-ray spectroscopy.
Knoxville, TN, June 13, 2010.
22. American Chemical Society Colloids and Interfaces.
The stability and structure of aqueous clusters of ferrihydrite nanoparticles
New York, June 12, 2009.
21. Materials Research Society Spring Meeting.
The Crystal Chemistry of Ferrihydrite.
San Francisco, April 15, 2009.
20. American Geophysical Union Fall Meeting.
From Crystal Chemistry to Colloid Stability.
San Francisco, December 15, 2008.
19. Synchrotron in the Environmental Sciences (SES-IV) Workshop.
Synchrotron Methods for Studying Nanostructure in Environmental Materials
San Francisco, December 12, 2008.
18. Society of Environmental Toxicology and Chemistry (SETAC) 28th Annual Meeting.
The geochemistry of ferric iron oxyhydroxide nanoparticles: A model for the fate and transport of nanomaterials in the environment
Milwaukee, November 11-15, 2007.
17. Workshop on Photon In-Photon Out Spectroscopy at the ALS User's Meeting.
X-ray spectroscopy and aqueous photochemistry of iron oxide nanoparticles
Berkeley, October 5, 2007.
16. Workshop on the Bio-physicochemical Interactions of Nanomaterials
Aspects of Nanoparticle Stability, Reactivity and Toxicity: Insights from the Environment
UCLA, September 9-11, 2007.
15. California Nanosystems Institute (CNSI) 3rd Annual Frontiers in Nanosystems
Nanogeoscience: Material Science Lessons from Natural Nanoparticles
Kauai, March 19-21, 2007.
14. American Chemical Society Fall Meeting
Interfacial interactions drive structure transformations in zinc sulfide nanoparticles
San Francisco, September 11-14, 2006.
13. 19th General Meeting of the International Mineralogical Association
(Keynote) *Nanoparticles in the Earth Sciences: Making the link between size dependent properties and reactivity*
Kobe, Japan, July 23-38, 2006.
12. X-ray Absorption Fine Structure XAFS 13
X-ray absorption and emission studies of environmental nanoparticles
Stanford University, Palo Alto, CA, July 9-14, 2006.
11. Mineralogical Society of America (MSA) Short Course on Molecular Geomicrobiology
Molecular-scale processes involving nanoparticulate minerals in biogeochemical systems.
Berkeley, CA, December 4, 2005.
10. Stanford Synchrotron Radiation Laboratory Workshop on Small-Angle X-Ray Scattering.
Nanoparticle clusters: An introduction to small-angle x-ray scattering.
Palo Alto, CA, Oct 19, 2005.

9. 88th Canadian Chemistry Conference and Exhibition (CSC 2005).
   Small- and wide-angle x-ray scattering studies of nanoparticles and their aggregates.
   Saskatoon, Canada, July 2005.
8. American Geophysical Union (AGU) Spring Meeting, 2005
   The colloid behavior of nanoparticles in aqueous environments.
   New Orleans, Liousianna, May 26 1, 2005.
7. NIRT Workshop in the Structure of Nanoparticles.
   X-ray scattering observations of structural modifications in zinc sulfide nanoparticles.
   Tempe, AZ, December 6-8, 2004.
6. SSRL Users meeting.
   Small angle scattering from nanoparticles.
   Stanford, Palo Alto, CA, October 16, 2004.
5. SSRL Users meeting.
   Investigations into the Surface Structure and Chemistry of ZnS Nanoparticles.
   Stanford, Palo Alto, CA, October 10, 2003.
4. American Chemical Society meeting.
   Special growth and transformation pathways in nanoparticles.
   New Orleans, LA, March 27, 2003.
3. User's Meeting of the UW-SRC. Tutorial presentation.
   X-ray Spectromicroscopy of Biological Specimens: Principles and Opportunities.
   SRC, Madison, WI, October 26, 2000.
2. *Synchrotron spectromicroscopy in Medicine and Biology*.
   Polish Synchrotron Society's 5th International School and Symposium on Synchrotron Radiation.
   Ustron-Jaszowiec, Poland. June 12-17, 2000.
1. *MEPHISTO Spectromicroscopy of Human Glioblastoma for Neutron Capture Therapy*.
   International Workshop on Spectromicroscopy.
   SRC, Madison, WI, October 23-25, 1998.

Contributed presentations

18. B. Gilbert, L. Comolli, R. Tinnacher, M. Kunz and J. F. Banfield.
    (Oral) Formation and restacking of disordered smectite osmotic hydrates.
    Euroclay, Edinburgh, July 10, 2015.
17. B. Gilbert, J. Erbs, R.L. Penn., A. Schwartzberg, P. Zarzycki & K. M. Rosso.
    (Oral) *Electron mobility and trapping in iron oxide, hydroxide and oxyhydroxide nanoparticles.*
    Réunion des Sciences de la Terre, Pau, France, October 28, 2014.
16. B. Gilbert, J. Erbs, R.L. Penn., D. Spagnoli, & G.A. Waychunas.
    (Oral) *Protonated nanoparticle models of 6-line ferrihydrite.*
    Goldschmidt Conference, Sacramento, CA, June 9, 2014.
15. B. Gilbert, J. Erbs, R.L. Penn., D. Spagnoli, V. Petkov, & G.A. Waychunas.
    (Oral) *A disordered whole-nanoparticle model for ferrihydrite.*
    Goldschmidt Conference, Florence, Italy, August 30, 2013.
14. B. Gilbert, J. Erbs, R.L. Penn., D. Spagnoli, V. Petkov, & G.A. Waychunas.
    (Oral) *Beneath the Bragg peaks and beyond the unit cell: A disordered whole-nanoparticle model for ferrihydrite*.
    Advances in Total Scattering Workshop, Santa Fe, October 17, 2012.
13 B. Gilbert, L.D. Scanlan, C. Clark, A. Tagmount & C. Vulpe.
    (Oral) *Chemical and morphological transformations of silver nanowires in aqueous media*.
    American Chemical Society March meeting, San Diego, March 26, 2012.

12. G. Lu & B. Gilbert.
(Oral) *Lattice Boltzmann Simulation of Diffusion and Sorption in Nanoparticle Aggregates*.
Computational Methods in Water Resources, San Francisco, July 7, 2008.
11. B. Gilbert.
(Oral) *Surface and electronic structure effects on interfacial charge transfer at iron oxide nanoparticle surfaces*.
Goldschmidt Conference, Cologne, August 23, 2007.
10. B. Gilbert.
(Oral) *Arrested aggregation: Nanocluster formation by iron oxyhydroxide nanoparticles*. ACS Colloids & Surfaces, Boulder, CO, June 18, 2006.
9. B. Gilbert.
(Oral) *The impact of aqueous colloid properties on the transport of metal oxide and sulfide nanoparticles*.
Society of Environmental Toxicology and Chemistry (SETAC) 26th Annual Meeting, Baltimore, November 16, 2005.
8. B. Gilbert, F. Huang, H. Zhang and J.F. Banfield.
(Oral) *Reversible, surface-controlled structure transformation in nanoparticles induced by aggregation state*.
Materials Research Society Spring Meeting, San Francisco, April 14, 2004.
7. B. Gilbert, F. Huang, H. Zhang and J.F. Banfield.
(Poster) *Measurements of the Internal Strain and Structural Dynamics of ZnS nanoparticles*.
Materials Research Society Spring Meeting, San Francisco, April 13, 2004.
6. B. Gilbert, F. Huang, H. Zhang and J.F. Banfield.
(Oral) *Surface modification of lattice dynamics in ZnS nanoparticles*.
American Geophysical Union Fall Meeting, San Francisco, December 8, 2003.
5. B. Gilbert, G. De Stasio, R. Andres, M. Neuman and D. Gabel.
(Oral) *The Chemical State of BSH following Administration to Patients with Glioblastoma Multiforme.*
9th International Symposium on Neutron Capture Therapy, Osaka, Japan, 206 October 2-6, 2000.
4. B. Gilbert, G. Margaritondo, S. Douglas, K.H. Nealson, R.F. Egerton, G. Rempfer, G. De Stasio.
(Poster) *X-ray microspectroscopy of biominerals with photoconductive charge compensation*.
8th International Conference of Electronic spectroscopy and Structure, ICESS 8, Berkeley, CA, August 8-12, 2000.
3. B. Gilbert, M. Neumann, S. Steen, D. Gabel, R. Andres, P. Perfetti, G. Margaritondo and Gelsomina De Stasio.
(Poster) *Immunohistochemistry for the MEPHISTO X-PEEM*.
X-ray Microscopy and Microanalysis XRM99, Berkeley, CA, August 2-6, 1999.
2. B. Gilbert, R. Andres, P. Perfetti, G. Margaritondo, and Gelsomina De Stasio.
(Poster) *Movie Acquisition with MEPHISTO X-PEEM for Microchemical Analysis: First Successful Tests*.
X-ray Microscopy and Microanalysis XRM99, Berkeley, CA, August 2-6, 1999.
1. B. Gilbert, R. Andres, P. Perfetti, G. Margaritondo, and Gelsomina De Stasio.
(Oral) *Elemental Mapping in Biological and Materials Science Specimens with Imaging Synchrotron Spectromicroscopy*.
2nd Int. SLS Workshop on Synchrotron Radiation, Brunnen, Switzerland, Oct. 26-30 1999.

Organization of Symposia and Conferences

6. B. Gilbert and J.-F. Boily (Theme 15 organizers)
   High-Resolution Geochemistry of Major Environmental Processes
   9 sessions at the Goldschmidt conference, Prague, August 2015.
5. B. Gilbert, C. L. Peacock and R. L. Penn
   Organic Matter Mineral Interactions: Theoretical, Experimental and Modeling Studies
   Goldschmidt conference, Sacramento, CA, June, 2014.
4. C. S. Kim & B. Gilbert.
   Assessing the Effective Reactivity of Aggregated Environmental Nanomaterials
   ACS Fall meeting, Denver, CO, August, 2011.
3. B. Gilbert and Steve Singer.
   Nanomineral transformations during biogeochemical cycles
   16th Annual V. M. Goldschmidt conference, Knoxville, TN, June, 2010.
2. C. S. Kim and B. Gilbert.
   Nanoscale Size Effects on Geochemical Processes: Reactivity, Kinetics, and Pathways
   13th Annual V. M. Goldschmidt conference, Melbourne, Australia, August 28, 2006.
1. B. Gilbert and J.F. Bargar.
   The Structure and Reactivity of Nanoparticles in the Environment
   American Chemical Society Fall Meeting, San Francisco, Sep. 13 & 14, 2006.