Curriculum Vitae

Paul Fenter

Chemical Sciences and Engineering Division
Argonne National Laboratory
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Research Group URL: http://www.anl.gov/cse/group/interfacial-processes

Education:

1990 Ph.D. (Physics) University of Pennsylvania,
Thesis: "The Structure and Growth of Reconstructed Metal Surfaces"
(Torgny Gustafsson, Thesis advisor)

1984 B.S. (Physics) Rensselaer Polytechnic Institute (magna cum laude)
Thesis: "Distribution of Domain Walls in a Reconstructed Surface"
(Toh-Ming Lu, Thesis advisor)

Professional Experience:

2014-present	Director, Center for Electrochemical Energy Science, an Energy Frontier Research Center
2007-present	Senior Physicist (level 709; currently RD6/RDL1), Chemical Sciences and Engineering Division, Argonne National Laboratory
2004-2007	Physicist (level 708), Environmental Research and Chemistry Divisions, Argonne National Laboratory
2002-present	Adjunct Professor, Department of Earth and Environmental Sciences, University of Illinois at Chicago
2000-present	Group Leader for Interfacial Processes
2000-present	DoE-BES Geosciences research program coordinator for ANL
2000-2004	Physicist (level 707), Environmental Research Division, Argonne National Laboratory
1997-2000	Physicist (level 706), Environmental Research Division, Argonne National Laboratory
1996-1997	Research Staff (with P.I. status), Princeton Materials Institute, Princeton University
1993-1996	Research Staff, Princeton Materials Institute, Princeton University
1990-1993	Post-Doctoral Fellow, Physics Department, Princeton University and Exxon Corporate Research (Annandale, New Jersey) (Peter M. Eisenberger, post-doctoral advisor)

Professional Societies:

American Physical Society, American Chemical Society, Geochemical Society.

Awards and Honors:

2012 Bertram E. Warren Diffraction Physics Award (American Crystallographic Association)
2007 Fellow, American Physical Society
2007 Pacesetter Award, Argonne National Laboratory
1992 Outstanding Post-Doctoral Fellow, Exxon Corporate Research Laboratory.

Research Interests:

-*Understanding of molecular scale phenomena at solid-liquid interfaces* including in-situ and real time studies of solid-liquid interface structure (water, ions, electrical double layer structure), growth/dissolution processes, interfaces in battery systems; interfacial organization of ionic liquids and CO_2 reduction.

-*Development of novel X-ray scattering approaches*: resonant anomalous X-ray scattering, X-ray standing wave imaging, interfacial X-ray microscopy; phase sensitive x-ray scattering, model-independent imaging.

Professional Service

Committees, Advisory Panels, etc. (Argonne):

Division Director Search Committee, member, Chemical Sciences and Engineering (ANL) (9/2016 – 6/2017).

Division Director Search Committee, member, X-ray Science Division, Advanced Photon Source (ANL), (11/2015-4/2016).

Science and Technical Advisory Committee (STAC) for the X-ray Interfacial Scattering Sector in the Advanced Photon Source upgrade (2012- 2015).

Hard X-ray Sciences Major Initiative, Argonne National Laboratory (member, Jan. 2011-2015).

Programmatic and Operations Committee-Hires and Promotion (POC-HP) member for Energy Sciences and Engineering (member, 2008-2010); Combined Physical Sciences and Engineering/Energy Engineering and Systems Analysis POCHP committee (member, 2010-2011; Chair, 2011).

Hard X-Ray Science Initiative Reviewer for Laboratory Directed Research and Development proposals (2010-present).

Advanced Photon Source Upgrade Interfacial Science Technical Advisory Committee (Feb. 2010- present).

Basic Energy Sciences Advisory Committee for the X-ray Science Division, Advanced Photon Source (Jan. 2010- present).

Strategic Planning Committee for Hard X-ray Science (2008).

Advanced Photon Source Renewal Process, Chair of Interfacial Science Panel (2008).

Beamline Advisory Committee (member) for Sector 33 at the Advanced Photon Source.

X-ray Interfacial Science Collaborative Access Team (XIS-CDT), Co-director of proposal to build a dedicated interfacial science sector at the Advanced Photon Source (November, 2008).

Advanced Photon Source Partner Users Executive Committee (representing BESSRC sectors), (member: 2005-2007).

Basic Energy Sciences Synchrotron Radiation Center (BESSRC) Advisory Committee at the Advanced Photon Source: Chair and member (2005-2006).

Basic Energy Sciences Synchrotron Radiation Center (BESSRC) Executive Committee at the Advanced Photon Source (2000-2005).

Advanced Photon Source Users Organization (APSUO) Steering Committee (elected, 1998-2001).

Argonne Library Committee (1998-present).

Basic Energy Sciences Synchrotron Radiation Center (BESSRC) Users Committee at the Advanced Photon Source (Chair 2001-2003; Member: 1997-2005).

Committees, Advisory Panels, etc. (External):

Scientific Advisory Board, Institute for Sustainability and Energy at Northwestern (ISEN), Northwestern University (2017-).

Department of Energy Basic Research Needs Workshop on "Future of Nuclear Energy" (Panel Lead), Rockville MD (August 9-11, 2017).

Department of Energy Basic Research Needs Workshop on "Next Generation Electrical Energy Storage" (Panel Member), Gaithersburg MD (March 27-29, 2017).

Department of Energy Basic Research Needs Workshop on "The Energy Water Nexus" (Factual Document writer), Gaithersburg MD (January 4-6, 2017).

Department of Energy Basic Research Needs Workshop on "Innovation and Discovery of Transformative Experimental Tools" (Panel Lead), Gaithersburg MD (June 1-3, 2016).

Los Alamos National Laboratory Institutional Science Technology and Engineering Capability Review, (May 1-4, 2016).

Department of Energy SubTER Grand Challenge Workshop: "Imaging Geophysical and Geochemical Signals in the Subsurface". Washington DC (Forrestal Building) (July 21, 2015).

Department of Energy Basic Energy Sciences, On-site Field Work Proposal Review (Actinide Research Program), Lawrence Berkeley National Laboratory, Berkeley CA (March 8-10, 2015).

Department of Energy Basic Energy Sciences, On-site Field Work Proposal Review (Geochemistry Research Program), Lawrence Berkeley National Laboratory, Berkeley CA (Sept. 18-21, 2011).

Department of Energy Basic Energy Sciences Program Review of the National Synchrotron Light Source, Brookhaven National Laboratory, Upton NY (December 14-16, 2010).

Proposal Review Panel (Molecular Environmental and Interfacial Science), Stanford Synchrotron Radiation Laboratory (June 2009-January 2012).

Environmental Science Program Review Committee at the Advanced Light Source, Lawrence Berkeley National Laboratory, Berkeley CA (October 9-10, 2008).

Department of Energy Basic Energy Sciences Program Review of the National Synchrotron Light Source, Brookhaven National Laboratory, Upton NY (April 30-May 2, 2008).

Department of Energy Basic Energy Sciences Program Review of the Advanced Light Source, Lawrence Berkeley Laboratory, Berkeley CA (March 4-6, 2008).

Envirosync Steering Committee, member (2007- 2009)

Envirosync Workshop to Assess Synchrotron Radiation Needs for the Molecular Environmental Science Community; Speaker and Working Group Leader on Surface and Interfacial Scattering (July 23-24 2007).

Department of Energy Basic Research Needs Workshop for Geosciences, Panelist (February 22-23, 2007).

Center for Environmental Molecular Science (Stony Brook University/Brookhaven National Laboratory), Member of the External Advisory Board (2005-2007).

Conference/Workshop Organization:

Workshop on Metal Adsorption at Interfaces, Advanced Photon Source Users Meeting, Argonne IL (May 7-9, 2012)

The 22nd V. M. Goldschmidt Conference, International Committee and Theme Leader (with Johannes Luetzenkirchen), "Interfacial Geochemistry: From Nano-scale Processes to Mesoscale Results", Montreal Canada (June 24-29, 2012).

Workshop on Emergent Interfacial Phenomena, Workshop Co-chair, APS/CNM/EMC Users Meeting, Argonne National Laboratory (May 2011).

The 11th International Surface X-ray Neutron Scattering Conference: Conference Co-chair, and Program committee chair (July 2010).

The 20th V. M. Goldschmidt Conference, "In-situ observations of fluid-mineral interfacial structure, dynamics and reactivity" (June 2010)

“Combined Methods in Materials Science”, American Crystallographic Association national meeting, Honolulu, HI (July 2006).

Advanced Photon Source Workshop on “In-Situ Characterization of Surface and Interface Structures and Processes”, APS Conference Center, Argonne, IL (September 8-9, 2005).

15’th V. M. Goldschmidt Conference, Session Organizer, "Advances in experimental and theoretical methods for characterization of mineral-fluid interfaces", Moscow ID (May, 2005).

13'th V. M Goldschmidt Conference, Session Organizer, "Mineral-Fluid Interactions: Molecular-scale Insights to Macroscopic Processes", Kurashiki Japan (September 9, 2003).

12'th Advanced Photon Source Users Meeting workshop, "Self-Assembly: From Molecules to Materials", Argonne, IL (April, 2003).

DoE-BES Geosciences Research Program Symposium: "Surficial Geochemical Processes", Argonne National Laboratory (March 7-8, 2003).

"Synchrotron Applications in Low Temperature Geochemistry and Environmental Science", American Geophysical Union national meeting, San Francisco CA (December 6-7, 2002).

Reviews in Mineralogy and Geochemistry (RiMG) short course, "Synchrotron Applications in Low Temperature Geochemistry and Environmental Science", Monterey CA (December 4-5, 2002).

"Synchrotron Environmental Science-II", Argonne National Laboratory, Argonne, IL (May, 6-8, 2002).

"BESSRC Third Users Meeting", Basic Energy Sciences Synchrotron Radiation Center, Argonne, IL (May 3, 2002).

"Complexity at the Water-Solid Interface: Mineral Surfaces and Nanoparticles", American Chemical Society National Meeting, Orlando FL (April, 2002).

"Environmental Science Workshop", 11'th Advanced Photon Source Users Meeting, Argonne, IL (October, 2001).

Publications

Publication Metrics (June, 2018):

Refereed Journal Articles: 146
Hirsch Index: h = 49 (Web of Science); >8800 citations; 61 citations/publication.
h=56 (Google Scholar; see my Google Scholar Profile)
ORCID Profile: http://orcid.org/0000-0002-6672-9748

Edited books:

Applications of Synchrotron Radiation in Low-Temperature Geochemistry and Environmental Science, Edited by P. Fenter, M. Rivers, N. C. Sturchio and S. Sutton (Reviews in Mineralogy and Geochemistry, Vol. 49), Geochemical Society (2002). (768 citations as of June, 2018)

Book Chapters (refereed):

M. J. Bedzyk and Paul Fenter, "XSW Imaging", in *The X-ray Standing Wave Technique: Principles and Applications*, Edited by J. Zegenhagen and A. Kazimirov, World Scientific Publishing Co, 289-302 (2013).

P. Fenter, "Applications of X-ray Standing Waves in Interfacial Geochemistry", in *The X-ray Standing Wave Technique: Principles and Applications*, Edited by J. Zegenhagen and A. Kazimirov, World Scientific Publishing Co, 369-377 (2013).

P. Fenter, "X-ray Reflectivity as a Probe of Mineral-Water Interfaces: A User Guide" in *Applications of Synchrotron Radiation in Low-Temperature Geochemistry and Environmental Science*, Edited by P. Fenter, M. Rivers, N. C. Sturchio and S. Sutton (Reviews in Mineralogy and Geochemistry, Vol. 49), Geochemical Society 149-220 (2002).

P. Fenter, "X-Ray and He Atom Diffraction Studies of Self-Assembled Monolayers", in *Thin Films: Self-Assembled Monolayers of Thiols*, Edited by A. Ulman, Academic Press 111-147 (1998).

T. Gustafsson and P. Fenter, "Medium Energy Ion Scattering with Channeling and Blocking", in *Encyclopedia of Materials Characterization: Instrumental Analytical Techniques for Surface and MicroAnalysis*, Eds. C. R. Brundle and C. A. Evans, Butterworth-Heineman Publishers, Manning Publications Co, New York (1992).

Review Article (Invited, refereed):

P. Fenter and N. C. Sturchio, "Mineral-Water Interfacial Structures Revealed by Synchrotron X-ray Scattering" *Progress in Surface Science* **77,** 171-258 (2004).

Review Articles (Invited, non-refereed):

M. J. Bedzyk, P. Fenter, Z. Zhang, L. Cheng, J. S. Okasinski, and N. C. Sturchio, "X-ray Standing Wave Imaging" (Invited review), *Synchrotron Radiation News*, **17**(3) 5-10 (2004).

P. Fenter, "Imaging Interfaces with X-rays" (Warren Award Lecture), *Reflexions*, Spring Issue, 28-30 (2013).

P. Fenter and S. S. Lee, "Hydration Layer Structure at Solid/Water Interfaces", *MRS Bulletin*, Special issue: "Water at Functional Interfaces", S. Garde and M. Schlossman, Editors, (2014)

Refereed Journal Articles (in reverse chronological order):

142) X. Chen, M. Vörös, J. C. Garcia, T. T. Fister, D. B. Buchholz, J. Franklin, Y. Du, T. C. Droubay, Z. Feng, H. Iddir, L. Curtiss, M. J. Bedzyk and P. Fenter, "Strain-driven Mn-reorganization in over-

lithiated $Li_xMn_2O_4$ epitaxial thin-film electrodes", *ACS Applied Energy Materials*, in press (2018).

141) E. Callagon La Plante, P.J. Eng, S.S. Lee, N.C. Sturchio, K.L. Nagy, and P. Fenter, "Evolution of Strain in Heteroepitaxial Cadmium Carbonate Overgrowths on Dolomite", *Crystal Growth and Design*, **18**(5), 2871-2882 (2018).

140) J. Medina-Ramos, W. Zhang, K. Yoon, P. Bai, A. Chemburkar, W. Tang, A. Atifi, S.S. Lee, T. T. Fister, B.J. Ingram, A. van Duin; M. Neurock, J. Rosenthal, Paul Fenter, "Cathodic Corrosion at the Bismuth-Ionic Liquid Electrolyte Interface under Conditions for CO_2 Reduction", *Chemistry of Materials*, **30**(7) 2362-2373 (2018).

139) X. Yu, X. Chen, D.B. Buchholz, S.A. Barnett, Q. Li, J. Wu, P.A. Fenter, M.J. Bedzyk, V.P. Dravid, "Pulsed Laser Deposition and Characterization of Hetero-epitaxial $LiMn_2O_4/La_{0.5}Sr_{0.5}CoO_3$ Bilayer Thin Films for Lithium Ion Battery Studies", *ACS Applied NanoMaterials*, **1 (2)**, 642-653 (2018).

138) J. J. Kim, H. S. Suh, C. Zhou, A. U. Mane, B. Lee, S. Kim, J. D. Emery, J. W. Elam, P. F. Nealey, P. Fenter, T. T. Fister, "Mechanistic Understanding of Tungsten Oxide In-Plane Nanostructures Growth via Sequential Infiltration Synthesis", *Nanoscale*, **10**, 3469-3479 (2018).

137) K. Yuan, V. De Andrade, Z. Feng, N.C. Sturchio, S.S. Lee1, P. Fenter, "Pb^{2+}-Calcite Interactions under Far-From-Equilibrium Conditions: Formation of Micro Pyramids and Pseudomorphic Growth of Cerussite", *Journal of Physical Chemistry C*, **122**(4), 2238–2247 (2018).

136) K. Yuan, S. S. Lee, J. Wang, N. C. Sturchio, P. Fenter, "Templating growth of a pseudomorphic lepidocrocite micro-shell at the calcite-water interface", *Chemistry of Materials*, **30**(3), 700-707 (2018).

135) J. Medina-Ramos, S. S. Lee, A. Hubaud, T. Fister, P. Fenter, R. Sacci, D. R. Mullins, D. A. Lutterman, J. L. DiMeglio, R. C. Pupillo, S. M. Velardo, Stephanie, J. Rosenthal, "Structural Dynamics and Evolution of Bismuth Electrodes during Electrochemical Reduction of CO_2 in Imidazolium-Based Ionic Liquid Solutions", *ACS Catalysis*, **7**, 7285–7295 (2017).

134) G. Evmenenko, T. T. Fister, D. B. Buchholz, F. C. Castro, Q. Li, J. Wu, V. P. Dravid, P. Fenter, M. J. Bedzyk, "Lithiation of multilayer Ni/NiO electrodes: Criticality of nickel layer thicknesses on conversion reaction kinetics", *Physical Chemistry-Chemical Physics* **19**, 20029-20039 (2017).

133) J. Bracco, S. S. Lee, J. Stubbs, P. J. Eng, F. Heberling, P. Fenter, A. Stack, "Hydration Structure of the Barite (001)-Water Interface: Comparison of X-ray Reflectivity with Molecular Dynamics Simulations", *Journal of Physical Chemistry C*, **121**, 12236−12248 (2017).

132) S. S. Lee, P. Fenter, K. L. Nagy, and N. C. Sturchio, "Real-time observation of cation exchange kinetics and dynamics at the muscovite–water interface", *Nature Communications*, **8**, 15826 (2017).

131) I. C. Bourg, Sang Soo Lee, Paul Fenter, Christophe Tournassat, "Structure and Energetics of the Stern layer at mica-water interfaces", *Journal of Physical Chemistry C*, **121** (17), 9402–9412 (2017).

130) X. Chen, T.T. Fister, J. Esbenshade, B. Shi, X. Hu, J. Wu, A.A. Gewirth, M.J. Bedzyk, and P. Fenter, "Reversible Lithiation Phase Conversion Reaction for Ti_xGe Alloy in a Ti/Ge Multilayer", *ACS Applied Materials & Interfaces*, **9**, 8169-8176 (2017).

129) C. Peebles, M.N. He, Z. X. Feng, C.C. Su, L. Zeng, M. J. Bedzyk, P. Fenter, Y. Wang, Z.C. Zhang, C. Liao, Investigation of Glutaric Anhydride as an Electrolyte Additive for Graphite/$LiNi_{0.5}Mn_{0.3}Co_{0.2}O_2$ Full Cells, *Journal of the Electrochemical Society*, **164** (2), A173-A179 (2017).

128) E. Callagon, S.S. Lee, P. Eng, N. Laanait, N.C. Sturchio, K.L. Nagy, and P. Fenter, "Heteroepitaxial growth of cadmium carbonate at dolomite and calcite surfaces: Mechanisms and rates", Geochimica et Cosmochimica Acta, **205**, 360-380 (2017).

127) K. Yuan, S. S Lee, V. De Andrade, N.C. Sturchio, P. Fenter, "The replacement of calcite ($CaCO_3$) by cerussite ($PbCO_3$)", *Environmental Science and Technology*, **50**(23): 12984-12991 (2016).

126) S. Hellebrandt, S. S. Lee, K. E. Knope, A. J. Lussier, J. E. Stubbs, P. J. Eng, L. Soderholm, P. Fenter, M. Schmidt, "A comparison of adsorption, reduction, and polymerization of the plutonyl(VI) and uranyl(VI) ions from solution onto the muscovite basal plane", *Langmuir*, **32**(41), 10473–10482 (2016).

125) N.Y. Sa, H. Wang, D.L. Proffit, A.L. Lipson, B. Key, M. Liu, Z.X. Feng, T.T. Fister, Y. Ren, C.J. Sun, J.T. Vaughey, P.A. Fenter, PA, K.A. Persson, A.K. Burrell, "Is alpha-V_2O_5 a cathode material for Mg insertion batteries?", *Journal of Power Sources*, **323,** 44-50 (2016).

124) G. Evmenenko, T. T. Fister, D. B. Buchholz, Q. Li, K.-S. Chen, J. Wu, V. P. Dravid, M. C. Hersam, P. Fenter, M. J. Bedzyk, "Morphological Evolution of Multilayer Ni/NiO Thin Film Electrodes during Lithiation", *ACS Applied Materials Interfaces*, ***8***(31), 19979–19986 (2016).

123) S. S. Lee, F. Heberling, N. C. Sturchio, P. J. Eng, and P. Fenter, "Surface Charge of the Calcite (104) Terrace Measured by Rb^+ Adsorption in Aqueous Solutions Using Resonant Anomalous X-ray Reflectivity", *Journal of Physical Chemistry C*, **120**(28), 15216-15223 (2016).

122) Zhenxing Feng, Xiao Chen, Timothy T. Fister, Michael J. Bedzyk, and Paul Fenter, "Phase Control of Mn-based Spinel Films via Pulsed Laser Deposition", *Journal of Applied Physics*, **120**, 015307 (2016).

121) B. Pan, Z. Feng, N. Sa, S.-D. Han, Q. Ma, P. Fenter, J.T. Vaughey, Z.C. Zhang, C. Liao, "Advanced hybrid battery with a magnesium metal anode and a spinel $LiMn_2O_4$ cathode", *Chemical Communications*, **52**(64), 9961-9964 (2016)

120) S. S. Lee, M. Schmidt, T. T. Fister, K. L. Nagy, N. C. Sturchio, and P. Fenter, "Structural characterization of aluminum (oxy)hydroxide films at the muscovite (001) – water interface", *Langmuir*, **32**(2), 477–486 (2016).

119) B.F. Pan, J.H. Huang, Z. Feng, L. Zeng, M. He, L. Zhang, J.T. Vaughey, M.J. Bedzyk, P. Fenter, Z.C. Zhang,; A.K. Burrell, C. Liao, "Polyanthraquinone-Based Organic Cathode for High-Performance Rechargeable Magnesium-Ion Batteries", *Advanced Energy Materials*, **6**(14) 1600140 (2015).

118) Z. Feng, X. Chen, L. Qiao, A. L. Lipson, T. T. Fister, L. Zeng, C. Kim, T. Yi, N. Sa, D. L. Proffit, A. K. Burrell, J. Cabana, B. J. Ingram, M. D. Biegalski, M. J. Bedzyk, and P. Fenter, "Phase-Controlled Electrochemical Activity of Epitaxial Mg-Spinel Thin Films", *Applied Materials Interfaces*, **7**, 28438-28443 (2015).

117) T. T. Fister, X. Hu, J. Esbenshade, X. Chen, J. Wu, V. Dravid, M. Bedzyk, B. Long, A. A. Gewirth, B. Shi, C. M. Schlepütz, P. Fenter, "Dimensionally-controlled lithiation of chromium oxide", *Chemistry of Materials*, **28**(1), 47–54 (2015).

116) J. L. Esbenshade, C. J. Barile, T. T. Fister, K. L. Bassett, P. Fenter, R. G. Nuzzo, and A. A. Gewirth, "Improving Electrodeposition of Mg through an Open Circuit Potential Hold", *Journal of Physical Chemistry C* **119,** 23366-23372(2015).

115) H. Zhou, A. Uysal, D.M. Anjos, Y. Cai, S.H. Overbury, M. Neurock, J.K. McDonough, Y. Gogotsi, and P. Fenter, "Understanding Defect-Stabilized Noncovalent Functionalization of Graphene", *Advanced Materials Interfaces*, 1500277(1-8) (2015).

114) N. Laanait, E. B. R. Callagon, Z. Zhang, N. C. Sturchio, S. S. Lee, P. Fenter, "X-ray Driven Reaction Front Dynamics at Mineral-Aqueous Interfaces", *Science*, **349**(6254), 1330-1334 (2015).

113) M. Schmidt, S. Hellebrandt, K. E. Knope, S. S. Lee, J. E. Stubbs, P J. Eng, L. Soderholm, P. Fenter, "Effects of the Background Electrolyte on Th(IV) Sorption to Muscovite Mica", *Geochimica et Cosmochimica Acta*, **165**, 280–293 (2015).

112) F. Bellucci, S. S. Lee, P. Fenter, J. D. Kubicki, A. Bandura, Z. Zhang, and D. J. Wesolowski, "Rb adsorption at the quartz (101) – aqueous interface: comparison of resonant X-ray reflectivity with ab-initio calculations", *Journal of Physical Chemistry C*, **119**, 4778-4788 (2015).

111) A. Uysal, H. Zhou, G. Feng, S. S. Lee, S. Li, P. T. Cummings, P. F. Fulvio, S. Dai, J. K. McDonough, Y. Gogotsi and P. Fenter, "Interfacial Room Temperature Ionic "Liquids": Connecting Static and Dynamic Structures", *Journal of Physics: Condensed Matter*, **27**(3) 032101 (2014) (*Fast Track Communication*).

110) N. Laanait, Z. Zhang, C. M. Schlepütz, J. Vila-Comamala, M. J. Highland, and P. Fenter, "Full-Field X-ray Reflection Microscopy of Epitaxial Thin-films", *Journal of Synchrotron Radiation*, **21**, 1252–1261 (2014).

109) E. Callagon, P. Fenter, K. L. Nagy, and N. C. Sturchio, "Incorporation of Pb at the Calcite (104)-Water Interface", *Environmental Science and Technology*, **48**(16), 9263-9269 (2014).

108) P. Fenter, P. Zapol, H. He, N. C. Sturchio, "On the Variation of Dissolution Rates at the Orthoclase (001) Surface with pH and Temperature", *Geochimica et Cosmochimica Acta*, **141**, 598-611 (2014).

107) X. Meng, J. A. Libera, T. T. Fister, H. Zhou, J. K. Hedlund, P. Fenter, and J. W. Elam, "Atomic Layer Deposition of Gallium Sulfide Films using Bis(Dimethylamido)Tetrakis(Dimethylamino) Digallium and Hydrogen Sulfide", *Chemistry of Materials*, **26** 1029-1039 (2014).

106) A. Uysal, H. Zhou, G. Feng, S. S. Lee, S. Li, P. Fenter, P. T. Cummings, P. F. Fulvio, S. Dai, J. K. McDonough, and Y. Gogotsi, "Structural Origins of Hysteresis at the Electrified Graphene/Ionic Liquid Interface", *Journal of Physical Chemistry C*, **118**, 569−574 (2014).

105) T. T. Fister, J. Esbenshade, X. Chen, B. R. Long, B. Shi, C. M. Schlepütz, A. A. Gewirth, M. J. Bedzyk, and P. Fenter, "Lithium intercalation behavior in multilayer silicon electrodes", *Advanced Energy Materials*, 1301494 (1-6) (2014).

104) M. Schmidt, S. S. Lee, R. E. Wilson, K. E. Knope, F. Bellucci, P. J. Eng, J.E. Stubbs, L. Soderholm, and P. Fenter, "Surface-Mediated Formation of Pu(IV) nanoparticles at the Muscovite-Electrolyte Interface", *Environmental Science and Technology* **47**, 14178-14184 (2013).

103) S.-S. Lee, P. Fenter, K. L. Nagy, and N. C. Sturchio "Investigation of structure, adsorption free energy, and overcharging behavior of trivalent yttrium adsorbed at the muscovite (001)-water interface", *Journal of Physical Chemistry* **117**, 23738-23749 (2013).

102) S.-S. Lee, P. Fenter, K. L. Nagy, and N. C. Sturchio, "Changes in Adsorption Free Energy and Speciation during Competitive Adsorption Between Monovalent Cations at the Muscovite (001)-Water Interface", *Geochimica et Cosmochimica Acta* **123**, 416-426 (2013).

101) Y. Liu, H.-H. Wang, Z. Zhang, S. S. Lee, P. A. Fenter, J. Z. Tischler, H. Hong, and T.-C. Chiang, "Interfacial Bonding and Structure of Bi_2Te_3 Topological Insulator Films on Si(111) Determined by Surface X-ray Scattering", *Physical Review Letter*s **110**, 226103(1-5) (2013).

100) T. T. Fister, J. Goldman, B. Long, R. Nuzzo, A. Gewirth, P. Fenter, "Surface Diffraction using the χ-axis Geometry", *Journal of Applied Crystallography*, **46** 639-643 (2013).

99) P. Fenter, S. Kerisit, P. Raiteri, J. D. Gale, "Is the Calcite-Water Interface Understood? Direct Comparisons of Molecular Dynamics Simulations with Specular X-ray Reflectivity Data", *Journal of Physical Chemistry C*, **117**(10), 5028-5042 (2013).

98) T. T. Fister, J. Goldman, B. Long, R. Nuzzo, A. Gewirth, P. Fenter, "X-ray Diffraction Microscopy of Lithiated Silicon Microstructures", *Applied Physics Letters* **102**(13), 131903 (2013).

97) H. Zhou, M. Rouha, G. Feng, S. S. Lee, H. Docherty, P. Fenter, P. T. Cummings, P. F. Fulvio, S. Dai, J. McDonough, V. Presser, and Y. Gogotsi, "Nano-scale Perturbations of Room Temperature Ionic Liquid Structure at Charged and Uncharged Interfaces", *ACS Nano*, **6**(11) 9818-9827 (2012).

96) S. S. Lee, P. Fenter, and C. Park, "In-situ x-ray transmission flow-through cell for studies of temporal and spatial variations of ion distributions at mineral – water interfaces", *Journal of Synchrotron Radiation*, **20**, 125-136 (2012).

95) A. L. Lipson, S. Chattopadhyay, H. J. Karmel, T. T. Fister, J. D. Emery, M. M. Thackeray, P. A. Fenter, M. J. Bedzyk, and M. C. Hersam, "Enhanced Lithiation of Doped 6H-SiC (0001) via High Temperature Vacuum Growth of Epitaxial Graphene", *Journal of Physical Chemistry C*, **116**, 20949-20957 (2012).

94) P. Fenter and N.C. Sturchio, "Calcite (104)-Water Interface Structure, Revisited", *Geochimica et Cosmochimica Acta*, **97**, 58-69 (2012).

93) T. T. Fister, M. M. Thackeray, P. A. Fenter, S. S. Lee, B. R. Long, A. A. Gewirth, B. Shi and L. Assoufid, "Real-time Observations of Interfacial Lithiation in a Metal Silicide Thin Film", *Journal of Physical Chemistry C*, **116**(42) 22341-22345 (2012).

92) S. Chattopadhyay, A. L. Lipson, H. J. Karmel, J. D. Emery, T. T. Fister, P. A. Fenter, M. C. Hersam, and M. J. Bedzyk, "In Situ X-ray Study of the Solid Electrolyte Interphase (SEI) Formation on Graphene as a Model Li-ion Battery Anode", *Chemistry of Materials*, **24**(15), 3038-3043 (2012).

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