

# ESD Fundamental & Exploratory Research Program Peer-Reviewed Journal Articles and Book Chapters for 2011

1. Anagnostou, E., R.M. Sherrell, A. Gagnon, M. LaVigne, M.P. Field, W.F. McDonough (2011), Seawater nutrient and carbonate ion concentrations recorded as P/Ca, Ba/Ca, and U/Ca in the deep-sea coral *Desmophyllum dianthus*. *Geochimica et Cosmochimica Acta*, 75 (1), 2529-2543; DOI: 10.1016/j.gca.2011.02.019.
2. Ali, S., M. Stute, T. Torgersen, G. Winckler, and B.M. Kennedy (2011), Helium measurements of pore-fluids obtained from SAFOD drillcore. *Hydrogeology Journal*, 19 (1), 237–247; DOI: 10.1007/s10040-010-0645-6. LBNL-3690E.
3. Armstrong, R., and J. Ajo-Franklin (2011), Investigating biomineralization using synchrotron based x-ray computed microtomography. *Geophysical Research Letters*, 38, L08406; DOI: 10.1029/2011GL046916. LBNL-4754E.
4. Bénézech, P., G.D. Saldi, J.-L. Dandurand, J. Schott (2011), Experimental determination of the solubility product of magnesite at 50 to 200 °C. *Chemical Geology*, 286 (1-2), 21-31; DOI: 10.1016/j.chemgeo.2011.04.016.
5. Berryman, J.G. (2011), Mechanics of layered anisotropic poroelastic media with applications to effective stress for fluid permeability. *International Journal of Engineering Science*, 49 (1), 122–139; DOI:10.1016/j.ijengsci.2010.06.027). LBNL-3589E.
6. Berryman, J.G. (2011), Bounds and self-consistent estimates for elastic constants of granular polycrystals composed of orthorhombics or crystal with higher symmetries. *Physical Review E*, 83, 046130; DOI:10.1103/PhysRevE.83.046130. LBNL-4411E.
7. Bill, M., L. O'Dogherty, P.O. Baumgartner (2011), Dynamics of a paleoecosystem reef associated with oceanic change in carbonate sedimentary regime and carbon cycling, (Oxfordian, Swiss Jura). *Palaios*, 26 (4), 197-211; DOI: 10.2110/palo.2010.p10-063r.
8. Bourg, I.C., and G. Sposito (2011), Molecular dynamics simulations of the electrical double layer on smectite surfaces contacting concentrated mixed electrolyte (NaCl-CaCl<sub>2</sub>) solutions. *Journal of Colloid and Interface Science*, 360, 701–715. LBNL-4934E.
9. Bourg, I.C., and G. Sposito (2011), Ion exchange phenomena. In: *Handbook of Soil Science*, 2nd Edition, P.M. Huang, Y. Li, and M.E. Sumner, eds., Chapter B6, CRC Press, Boca Raton, FL. LBNL-4940E.
10. Charlet, L., G. Morin, J. Rose, Y. Wang, M. Auffan, A. Burnol, A. Fernandez-Martinez (2011), Reactivity at (nano)particle-water interfaces, redox processes, and arsenic transport in the environment. *Comptes Rendues Geosciences*, 343 (2-3), 123-139; DOI: 10.1016/j.crte.2010.11.005.
11. Commer, M., G.A. Newman, K.H. Williams, and S.S. Hubbard (2011), Three-dimensional induced polarization data inversion for complex resistivity. *Geophysics*, 76 (3), F157–171; DOI:10.1190/1.3560156. LBNL-4759E.
12. DePaolo, D.J. (2011), Surface kinetic model for isotopic and trace element fractionation during precipitation of calcite from aqueous solutions. *Geochimica et Cosmochimica Acta*, 75, 1039–1056; DOI:10.1016/j.gca.2010.11.020. LBNL-4248E.
13. Fernandez, D.P., A.C. Gagnon, and J.F. Adkins (2011), An isotope dilution ICP-MS method for the determination of Mg/Ca and Sr/Ca ratios in calcium carbonate. *Geostandards*

- and *Geoanalytical Research*, 35(1), 23-37; DOI: 10.1111/j.1751-908X.2010.00031.x.
14. Gibbs, G.V., A.F. Wallace, R.T. Downs, N.L. Ross, D.F. Cox and K.M. Rosso (2011), Thioarsenides: a case for long-range Lewis acid–base-directed van der Waals interactions. *Physics and Chemistry of Minerals*, 38 (4), 267-291; DOI: 10.1007/s00269-010-0402-3.
  15. He, G., G. Pan, M. Zhang, and G.A. Waychunas (2011), Coordination structure of adsorbed Zn(II) at water-TiO<sub>2</sub> interfaces. *Environmental Science & Technology*, 45 (5), 1873–1879; DOI: 10.1021/es1035283. LBNL-4274E.
  16. Horng, J., C.-F. Chen, B. Geng, C. Girit, Y. Zhang, Z. Hao, H.A. Bechtel, M. Martin, A. Zettl, M.F. Crommie, Y.R. Shen, and F. Wang (2011), Drude conductivity of Dirac fermions in graphene. *Physical Review B*, 83 (16), 165113, DOI: 10.1103/PhysRevB.83.165113.
  17. Khaokaew, S., R.L. Chaney, G. Landrot, M. Ginder-Vogel, and D.L. Sparks (2011), Speciation and release kinetics of cadmium in an alkaline paddy soil under various flooding periods and draining conditions. *Environmental Science & Technology*, 45 (10), 4249-4255; DOI: 10.1021/es103971y.
  18. Korneev, V.A. (2011), Krauklis wave in a stack of alternating fluid-elastic layers. *Geophysics*, 76 (6), N47–N53; DOI: 10.1190/GEO2011-0086.1. LBNL-5472E.
  19. Kwon, K.D., K. Refson, S. Bone, R. Qiao, W. Yang, Z. Liu, and G. Sposito (2011), Magnetic ordering in tetragonal FeS: Evidence for strong itinerant spin fluctuations. *Physical Review B*, 83, 064402. LBNL-4983E.
  20. Liu, W.-T., J. Cao, W. Fan, Z. Hao, M.C. Martin, Y.R. Shen, J. Wu, and F. Wang (2011), Intrinsic optical properties of vanadium dioxide near the insulator-metal transition. *Nano Letters*, 11 (2) 466-470; DOI: 10.1021/nl1032205.
  21. Lu, G., H.-H. Liu, and R. Salve (2011), Long term infiltration and tracer transport in fractured rock: Field observations and model analyses. *Journal of Hydrology*, 396 (1-2), 33-48; DOI: 10.1016/j.jhydrol.2010.10.030.
  22. Masson, Y.J., and S.R. Pride (2011), Seismic attenuation due to patchy saturation. *Journal of Geophysical Research (JGR)—Solid Earth*, 116, B03206, 1-17; DOI: 10.1029/2010JB007983.
  23. Mays, D.C., O.T. Cannon, A.W. Kanold, K.J. Harris, T.C. Lei, and B. Gilbert (2011), Static light scattering resolves colloid structure in index-matched porous media. *Journal of Colloid and Interface Science*, 363, (1), 418-424; DOI: 10.1016/j.jcis.2011.06.046.
  24. Navarre-Sitchler, A., C.I. Steefel, P.B. Sak, and S.L. Brantley, (2011), A reactive-transport model for weathering rind information on basalt. *Geochimica et Cosmochimica Acta*, 75 (23), 7644-7667; DOI: 10.1016/j.gca.2011.09.033.
  25. Nielsen, L., J. Druhan, W. Wang, and D.J. DePaolo (2010), Calcium isotopes as tracers of biogeochemical processes. In: *Handbook of Environmental Isotope Geochemistry*, Vol I, M. Baskaran, ed., *Advances in Isotope Geochemistry*, Chapter 7, pp. 105–124; DOI: 10.1007/978-3-642-10637-8\_7.
  26. Pau, G.S.H., J.B. Bell, A.S. Almgren, K.M. Fagnan, and M.J. Lijewski (2011), An adaptive mesh refinement algorithm for compressible two-phase flow in porous media. *Computational Geosciences*, 16 (3), 577-592; DOI: 10.1007/s10596-011-9270-2.
  27. Pena, J., J.R. Bargar, and G. Sposito (2011), Role of bacterial biomass in the sorption of Ni by biomass-birnessite assemblages. *Environmental Science & Technology*, 45 (17), 7338-7344; DOI: 10.1021/es201446r.
  28. Pili, E., B.M. Kennedy, M.E. Conrad, and J.-P. Gratier (2011), Isotopic evidence for the infiltration of mantle and metamorphic CO<sub>2</sub>-H<sub>2</sub>O fluids from below in faulted rocks

- from the San Andreas Fault System. *Chemical Geology*, 281 (3-4), 242-252; DOI:[10.1016/j.chemgeo.2010.12.011](https://doi.org/10.1016/j.chemgeo.2010.12.011). LBNL-4273E.
29. Roubinet, D., H.-H. Liu, and J.-R. de Dreuzy (2011), A new particle-tracking approach to simulating transport in heterogeneous fractured porous media. *Water Resources Research*, 46, W11057; DOI: 10.1029/2010WR009371.
  30. Simon, J.I., I.D. Hutcheon, S.B. Simon, J.E.P. Matzel, E.C. Ramon, P.K. Weber, L. Grossman, and D.J. DePaolo (2011), Oxygen isotope variations at the margin of a CAI records circulation within the solar nebula. *Science*, 331, 1175–1178; DOI: 10.1126/science.1197970.
  31. Sung, J., L. Zhang, C. Tian, G.A. Waychunas, and Y.R. Shen (2011), Surface structure of protonated R-plane-sapphire (1-102) studied by sum frequency vibrational spectroscopy. *Journal of American Chemical Society*, 133 (11), 3846–3853; DOI: 10.1021/ja104042u. LBNL-5399E.
  32. Sung, J., G.A. Waychunas, and Y.R. Shen (2011), Surface-induced anisotropic orientations of interfacial ethanol molecules at air/sapphire (1-102) and ethanol/sapphire (1-102) interfaces. *Journal of Physical Chem. Letters*, 2 (14), 1831–1835; DOI: 10.1021/jz2006397. LBNL-5400E.
  33. Sung, J., L. Zhang, C. Tian, Y.R. Shen and G.A. Waychunas (2011), Effect of pH on the Water/a-Al<sub>2</sub>O<sub>3</sub> (1-102) interface structure studied by sum-frequency vibrational spectroscopy. *Journal of Physical Chemistry C*, 115 (28), 13887-13893; DOI: 10.1021/jp2046596. LBNL-5398E.
  34. Tokunaga, T. (2011), Physicochemical controls on absorbed water film thickness in unsaturated geological media. *Water Resources Research*, 47, W08514; DOI: 10.1029/2011WR010676. LBNL-4943E.
  35. Vasco, D.W. (2011), On the propagation of a quasi-static disturbance in a heterogeneous, deformable, and porous medium with pressure-dependent properties. *Water Resources Research*, 47, W12523; DOI: 10.1029/2011WR011373. LBNL-5285E.
  36. Vasco, D.W. (2011), On the propagation of a coupled saturation and pressure front. *Water Resources Research*, 47, W03526; DOI:10.1029/2010WR97-865. LBNL-4185E.
  37. Watkins, J.M., D.J. DePaolo, F.J. Ryerson, and B. Peterson (2011), Influence of liquid structure on diffusive isotope separation in molten silicates and aqueous solutions. *Geochimica et Cosmochimica Acta*, 75, 3103–3118. LBNL-5133E.
  38. Yang, L., C.E. Killian, M. Kunz, N. Tamura, and P.U.P.A. Gilbert (2011), Biomineral nanoparticles are space-filling. *Nanoscale*, 3 (2), 603-609; DOI: 10.1039/C0NR00697A.

### **ESD Fundamental & Exploratory Research Conference Papers and Proceedings for 2011**

1. Conrad, M. (2011) Isotope monitoring of in situ biodegradation of chlorinated solvents. Invited Presentation at the Stanford Civil and Environmental Engineering Dept Seminar Series, January 28, 2011.
2. Davis, J.A. (2011), Effects of redox processes and aqueous speciation on uranium mobility in groundwater. Invited Presentation at the CSIRO Distinguished Speakers Series, February 1, 2011.
3. Molins, S., D.B. Silin, D. Trebotich, and C.I. Steefel (2011), Direct pore-scale numerical simulation of precipitation and dissolution. Invited Presentation at the Goldschmidt 2011 Conference, Prague, Czech Republic, August 14-19, 2011.

4. Oelkers, E.H., G.D. Saldi, and J. Schott (2011), Is mineral precipitation the reverse of dissolution? Proceedings, Goldschmidt Conference Abstracts, Mineralogical Magazine, 75 (3), 1559.
5. Saldi, G.D., D. Daval, M. Xu, S.R. Higgins, K.G. Knauss (2011), Development of steady-state surface topography and the determination of dolomite dissolution rates. Proceedings, Goldschmidt Conference Abstracts, Mineralogical Magazine, 75 (3), 1784.
6. Shen, C., D. Trebotich, S. Molins, D.T. Graves, B. Van Straalen, T. Ligocki, and C.I. Steefel (2011), High performance computations of subsurface reactive transport processes at the pore scale.
7. Sissmann, O., D. Daval, I. Martinez, F. Brunet, N. Findling, and F. Guyot (2011), Effects of organic ligands and temperature on the kinetics and mechanisms of olivine carbonation. Proceedings, Goldschmidt Conference Abstracts, Mineralogical Magazine, 75 (3), 1885.

### **ESD Fundamental & Exploratory Research Reports for 2011**

1. Bourg, I.C., and C.I. Steefel (2011), Molecular dynamics simulations of water confined in silica nanopores: Influence of pore radius on diffusion and surface protonation. LBNL Report, Berkeley, California.

## **2010**

### **Peer-Reviewed Journal Articles, Books, and Book Chapters for 2010**

1. Aciego, S.M., F. Jourdan, D.J. DePaolo, B.M. Kennedy, P.R. Renne, and K.W.W. Sims (2010), Combined U-Th/He and  $^{40}\text{Ar}/^{39}\text{Ar}$  geochronology of post-shield lavas from the Mauna Kea and Kohala volcanoes, Hawaii. LBNL-3059E. *Geochimica et Cosmochimica Acta*, 74 (5), 1620–1635; DOI:10.1016/j.gca.2009.11.020.
2. Ali, S., M. Stute, T. Torgersen, G. Winckler, and B.M. Kennedy (2010), Helium measurements of pore-fluids obtained from SAFOD drillcore. LBNL-3690E. *Hydrogeology Journal*, DOI:10.1007/s10040-010-0645-6.
3. Aydin, A., and J.G. Berryman (2010), Analysis of the growth of strike-slip faults using effective medium theory. LBNL-3014E. *Journal of Structural Geology*, 32, 1629–1642; DOI:10.1016/j.jsg.2009.11.007.
4. Berryman, J.G. (2010), Poroelastic measurement schemes resulting in complete data sets for granular and other anisotropic porous media. LBNL-2914E. *International Journal of Engineering Sciences*, 48, 446–459.
5. Berryman, J.G., and A. Aydin (2010), Quasi-static analysis of elastic behavior for some systems having higher fracture densities. LBNL-3016E. *International Journal for Numerical and Analytical Methods in Geomechanics*, 34, 1687–1724.
6. Berryman, J.G., and S. Nakagawa (2010), Inverse problem in anisotropic poroelasticity: Drained constants from undrained ultrasound measurements. LBNL-3013E. *Journal of the Acoustical Society of America*, 127 (2), 720–729.
7. Berryman, J.G. (2010) Pore-fluid effects on seismic waves in vertically fractured

- earth with orthotropic symmetry. LBNL-4114E. *Geophysics*, 75 (6), T185–T200.
8. Bourg, I.C., and G. Sposito (2010), Connecting the molecular scale to the continuum scale for diffusion processes in smectite-rich porous media. LBNL-3045E. *Environmental Science & Technology*, 44 (6), 2085–2091; DOI: 10.1021/es903645a.
  9. Bourg, I.C., F.M. Richter, J.N. Christensen, and G. Sposito (2010), Isotopic mass-dependence of metal cation diffusion coefficients in liquid water. LBNL-3046E. *Geochimica et Cosmochimica Acta*, 74 (8), 2249–2256.
  10. Cortis, A., C.E. Puente, and B. Sivakumar (2010), Encoding hydrologic information via a fractal geometric approach and its extensions. *Stochastic Environmental Research and Risk Assessment*, 24(5), 625–632.
  11. Cortis, A., and J.G. Berryman (2010), Frequency-dependent viscous flow in channels with fractal rough surfaces. LBNL-3602E. *Physics of Fluids*, 22, 053603.
  12. Ewing, S.A., J.N. Christensen, S.T. Brown, R.A. Vancuren, S.S. Cliff, and D.J. DePaolo (2010), Pb isotopes as an indicator of the Asian contribution to particulate air pollution in urban California. *Environmental Science & Technology*, 44 (23), 8911–8916; DOI: 10.1021/es101450t.
  13. Fantle, M.S., K.M. Maher, and D.J. DePaolo (2010), Isotopic approaches for quantifying the rates of marine burial diagenesis. *Reviews of Geophysics*, 48, RG3002; DOI: 10.1029/2009RG000306.
  14. Ghose, S.K., G.A. Waychunas, T.P. Trainor, and P.J. Eng (2010), Hydrated goethite ( $\alpha$ -FeOOH) (100) interface structure: Ordered water and surface functional groups. LBNL-4137E. *Geochimica et Cosmochimica Acta*, 74 (7), 1943–1953.
  15. Gilbert, B., J.E. Katz, J.D. Denlinger, Y. Ying, R.W. Falcone and G.A. Waychunas (2010), Soft X-ray spectroscopy study of the electronic structure of oxidized and partially-oxidized magnetite nanoparticles. *Journal of Physical Chemistry C*, 114, 21994–22001.
  16. Hinnell, A.C., T.P.A. Ferre, J.A. Vrugt, J.A. Huisman, S. Moysey, J. Rings, and M.B. Kowalsky (2010), Improved extraction of hydrologic information from geophysical data through coupled hydrogeophysical inversion. LBNL-3089E. *Water Resources Research*, 46, W00D40; DOI: 10.1029/2008WR007060).
  17. Jun, Y.S., B. Lee, and G.A. Waychunas (2010), *In situ* observations of nanoparticle early development kinetics at mineral-water interfaces. *Environmental Science & Technology*, 44, 8182–8189.
  18. Katz, J.E., B. Gilbert, X. Zhang, K. Attenkofer, and G.A. Waychunas (2010), Observation of transient iron(II) formation in dye-sensitized iron oxide nanoparticles by time-resolved X-ray spectroscopy. *J. Phys. Chem. Letters* 1, 1372–1376.
  19. Kwon, K., K. Refson, and G. Sposito (2010), Surface complexation of Pb(II) by hexagonal birnessite nanoparticles. LBNL-4214E. *Geochimica et Cosmochimica Acta*, 74, 6731–6740.
  20. Kwon, K., and G. Sposito (2010), Reactivity of biogenic manganese oxide for metal sequestration and photochemistry: LBNL-3685E. Computational solid state physics study. *Journal of the Mineralogical Society of Korea (in Korean)*, 23, 161–170.
  21. Lee, V.E., D.J. DePaolo, and J.N. Christensen (2010), Uranium series comminution ages of continental sediments: Case study of a Pleistocene alluvial fan. LBNL-3832E. *Earth and Planetary Science Letters*, 296 (3–4), 244–254.

22. Masson, Y.J. and S.R. Pride (2010), Finite-difference modeling of Biot's poroelastic equations across all frequencies. LBNL-2808E. *Geophysics*, 75 (2); DOI:10.1190/1.3332589.
23. Mulvihill, M.J., S.E. Habas, I.J. La Plante, J. Wan, and T. Mokari (2010), The influence of size, shape, and surface coating on the stability of aqueous nanoparticle suspensions. LBNL-4124E. *Journal of Physical Chemistry*, 22 (18), 5251–5257.
24. Peña, J., K.D. Kwon, K. Refson, J.R. Bargar, and G. Sposito (2010), Mechanisms of nickel sorption by a bacteriogenic birnessite. LBNL-3657E. *Geochimica et Cosmochimica Acta*, 74, 3076–3089.
25. Rucci, A., D.W. Vasco, and F. Novali (2010). Fluid pressure arrival time tomography: Estimation and assessment in the presence of inequality constraints, with an application to a producing gas field at Krechba, Algeria. LBNL-3558E. *Geophysics*, 75 (6), 039; DOI:10.1190/1.3493504.
26. Silin, D., L. Tomutsa, S. Benson, and T. Patzek (2010), Microtomography and pore-scale modeling of two-phase fluid distribution. LBNL-3999E. *Transport in Porous Media*, 86 (2), 495–515; DOI: 10.1007/s11242-010-9636-2.
27. Vasco, D.W., A. Rucci, A. Ferretti, F. Novali, R. Bissell, P. Ringrose, A. Mathieson, and I. Wright (2010), Satellite-based measurements of surface deformation reveal fluid flow associated with the geological storage of carbon dioxide. LBNL-3018E. *Geophysical Research Letters*, 37, L03303; DOI: 10.1029/2009GL041544.
28. Vasco, D. (2010), On the propagation of a coupled saturation and pressure front. LBNL-4185E. *Water Resources Research*, 47, W03526; DOI:10.1029/WR97-865.
29. Vasco, D. (2010), On fluid flow in a heterogeneous medium under nonisothermal conditions. LBNL-4184E. *Water Resources Research*, 46; W12513; DOI:10.1029/2010WR009571.
30. Xu, M., X. Hu, K.G. Knauss, and S.R. Higgins (2010), Dissolution kinetics of calcite from 50–70°C: An atomic force microscopic study under near-equilibrium conditions. *Geochimica et Cosmochimica Acta*, 74, 4285–4297.
31. Zhang, H.Z., B. Chen, Y. Ren, G.A. Waychunas, and J.F. Banfield (2010), Response of nanoparticle structure to different types of surface environments: Wide-angle x-ray scattering and molecular dynamics simulations. *Physical Review B*, 81 (12), Article 125444.

## 2009

### Peer-Reviewed Journal Articles, Books, and Book Chapters for 2009

1. Bazin, D., X. Carpentier, I. Brocheriou, P. Dorfmüller, S. Aubert, C. Chappard, D. Thiaudiere, S. Reguer, G. Waychunas, P. Jungers, and M. Daudon, Revisiting the localization of Zn<sup>2+</sup> cations sorbed on pathological apatite calcifications made through X-ray absorption spectroscopy. LBNL-2933E. *Biochimie*, 91, 1294–1300, 2009.
2. Berryman, J.G., Poroelastic measurement schemes resulting in complete data sets for granular and other anisotropic porous media. LBNL-2914E. *International Journal of Engineering Sciences*, 48, 446–459 (published online 2009), 2010.

3. Berryman, J.G., and A. Aydin, Quasi-static analysis of elastic behavior for some systems having higher fracture densities. LBNL-3016E. International Journal for Numerical and Analytical Methods in Geomechanics (in press, published online 2009), 2010.
4. Berryman, J.G., Aligned vertical fractures, HTI reservoir symmetry, and Thomsen seismic anisotropy parameters for polar media. LBNL-63659. Geophysical Prospecting, 57, 193–208, 2009.
5. Berryman, J.G., Frequency dependent thermal expansion in binary viscoelastic composites. LBNL-63655. Mechanics of Materials, 41, 463–480, 2009.
6. Berryman, J.G., Fluid effects on seismic waves in hard rocks with fractures and in soft granular media. LBNL-2041E. In: Poro-Mechanics IV, H.I. Ling, A. Smyth, and R. Betti, eds., Proceedings of the Fourth Biot Conference on Poromechanics, Columbia University, New York, New York, June 8–10, 2009, DESTech Publications, Lancaster, Pennsylvania, pp. 598–603, 2009.
7. Borg, L.E., A.M. Gaffney, C.K. Shearer, D.J. DePaolo, I.D. Hutcheon, T.L. Owens, E. Ramon, and G. Brennecke, Mechanisms for incompatible-element enrichment on the Moon deduced from the lunar basaltic meteorite Northwest Africa. *Geochimica et Cosmochimica Acta*, 73, 3963–3980. DOI: 03210.1016/j.gca.2009.03.039, 2009.
8. Bourg, I.C., and G. Sposito, Connecting the molecular scale to the continuum scale for diffusion processes in smectite-rich porous media. LBNL-3045E. Environmental Science & Technology, published online 2009 (DOI: 10.1021/es903645a) 2010.
9. Gilbert, B., 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.
10. Gilbert, B., C. Frandsen, E. Maxey and D. M. Sherman, Soft x-ray spectroscopy studies of the electronic structure of hematite nanoparticles. *Physical Review B*, 79, 035108 2009.
11. Kneafsey, T.J, and K. Pruess, Laboratory flow experiments for visualizing carbon dioxide-induced, density-driven brine convection. LBNL-2731E. Transport in Porous Media: Special Issue on Geologic Carbon Storage (published online 2009), DOI 10.1007/s11242-009-9482-2, Springer, 2010.
12. Kwon, K.D., K. Refson, and G. Sposito, On the role of Mn(IV) vacancies in the photoreductive dissolution of hexagonal birnessite. LBNL-2054E. *Geochimica et Cosmochimica Acta*, 73, 4142–4150, 2009.
13. Kwon, K.D., K. Refson, and G. Sposito, Zinc surface complexes on birnessite: A density functional theory study. LBNL-1553E. *Geochimica et Cosmochimica Acta*, 73, 1273–1284, 2009.
14. Lo, W.-C., G. Sposito, and E. Majer, Analytical decoupling of poroelasticity equations for acoustic-wave propagation and attenuation in a porous medium containing two immiscible fluids. *Journal of Engineering Mathematics*, 64, 219–235, 2009.
15. Lu, G., D.J. DePaolo, Q. Kang, and D. Zhang, Lattice Boltzmann simulation of snow crystal growth in clouds. *Journal of Geophysics Research*, 114, D07305, doi: 10.1029/2008JD011087, 2009.
16. Maher, K., C. I. Steefel, A.F. White, D.A. Stonestrom, The role of reaction affinity

- and secondary minerals in regulating chemical weathering rates at the Santa Cruz Soil Chronosequence, California. LBNL-1761E. *Geochimica et Cosmochimica Acta*, 73 (10), 2804–2831, 2009.
17. Nakagawa, S., Poroelastic modeling of fracture-seismic wave interaction. LBNL-1056E. *International Journal of the JCRM*, 4(2), 5–14, 2009.
  18. Navarre-Sitchler, A., C.I. Steefel, L. Yang, L. Tomutsa, and S.L. Brantley, Evolution of porosity and diffusivity associated with chemical weathering of a basalt clast. LBNL-1759E. *Journal of Geophysical Research*, 114, doi:10.1029/2008JF001060, 2009.
  19. Nico, P.S., B.M. Kumfer, I.M. Kennedy, and C. Anastasio, Redox dynamics of mixed metal (Mn, Cr, and Fe) ultrafine particles. LBNL-811E. *Aerosol Science and Technology*, 43 (1), 60–70, 2009.
  20. Nico, P. S., B.D. Stewart, and S. Fendorf, Incorporation of oxidized uranium into Fe (hydr)oxides during Fe(II) catalyzed remineralization. LBNL-2506E. *Environmental Science & Technology*, 43 (19), 7391–7396, 2009.
  21. Spagnoli, D., 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. LBNL-2936E. *Geochimica & Cosmochimica Acta*, 73, 4023–4033, 2009.
  22. Steefel, C.I., and K. Maher, Fluid-rock interaction: A reactive transport approach. LBNL-1798E. *Reviews in Mineralogy and Geochemistry*, 70 (1), 485–532, 2009.
  23. Tokunaga, T. K., Hydraulic properties of adsorbed water films in unsaturated porous media. LBNL-1787E. *Water Resources Research*, 45, W06415, doi:10.1029/2009WR007734, 2009.
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