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**EDUCATION:**

**1977 Ph.D.** Environmental Sciences and Engineering, Stanford University, USA  
**1973 M.S.** Civil Engineering, Stanford University  
**1972 B.S.** Chemical Engineering, Carnegie-Mellon University

**PROFESSIONAL EXPERIENCE:**

**2010-2016:** Senior Geological Scientist, Lawrence Berkeley National Laboratory  
**2010-2011:** OCE Distinguished Visiting Scientist, CSIRO Division of Land and Water, Perth, Australia  
**1980-2010:** Senior Research Scientist, U.S. Geological Survey, Water Resources Division  
**1989-90:** Visiting Scientist, Australian Nuclear Science and Technology Organization  
**1978-80:** Postdoctoral Scientist, Swiss Federal Institute for Water Resources (EAWAG), Zurich, Switzerland

**RESEARCH EXPERIENCE**

James A. Davis has performed extensive research on geochemical processes occurring at mineral surfaces and their effects on water and sediment phase compositions in aquifers. The work has examined geochemical processes at multiple scales, from molecular-scale spectroscopic studies to large field-scale investigations. The field investigations include studies of uranium and other metal contaminant transport at various physical scales and in differing geochemical regimes, including detailed studies conducted at two uranium mill tailings (UMTRAP) sites (Naturita and Rifle, Colorado, USA), at two uranium (and other radionuclide) disposal legacy sites (Hanford 300 Area, Washington, USA and Savannah River F-area, South Carolina, USA), and a uranium tailings pit closure project (Ranger uranium mine, Australia). The work has focused on how the transport of uranium(VI), arsenic(V) and arsenic(III) are affected by coupled adsorption, redox reactions, and competitive sorption processes, and the incorporation of conceptual models for these processes into reactive transport simulations. An approach to modeling the influence of variable chemistry on uranium and metal ion adsorption and transport has been demonstrated at several field sites at the km scale. In addition, bioremediation and passive reactive barriers have been studied in detail as remediation techniques for uranium-contaminated sites at an UMTRAP site (Rifle) and a uranium ore upgrading site (Fry Canyon, Utah, USA). Current research is focused on the biogeochemistry of uranium and arsenic and their transport in engineered or natural groundwater systems

**PROFESSIONAL ACTIVITIES**

Reactive Transport Modeling Instruction: a) PHREEQC, one week course, KIGAM, Taejon, Korea, May 2014, and b) PHT3D (Bordeaux, France, March 2014) and (Copenhagen, Denmark, June 2016).

Co-PI of CSIRO-LBNL project studying uranium sorption and transport away from the Ranger uranium mine in the Northern Territory of Australia, the largest uranium mine in Australia (2011-2014).

Symposium Co-Chairman for “Metal and Metalloid Speciation and Adsorption”, American Chemical Society annual conference, Salt Lake City: March 2009  
Organizing Committee and Panel Chair, DOE Workshop on Basic Research Needs for the Geosciences, Nuclear Waste Disposal and Carbon Sequestration, 2006-2007.  
Technical Direction Team, Sorption Project, Nuclear Energy Agency (OECD, Paris): 2000-2007.  
Chairman, Working Group on Subsurface Reactive Transport Modeling, Interagency Steering Committee on Multimedia Environmental Models, 2003-2006.  
Associate Editor, Water Resources Research: 1997-2001.  
Symposium Co-Chairman for “Groundwater Remediation of Trace Metals, Radionuclides, and Nutrients with Permeable Reactive Barriers”, American Geophysical Union Meeting, San Francisco: Dec. 1999.  
Executive Committee, Hydrology Section, American Geophysical Union: 1995 - 1997.  
Symposium Chairman for "Surface Chemistry of Natural Materials", Goldschmidt Conference, Reston, VA, May 1992.  
Chairman, Geochemistry Division, American Chemical Society: 1992.  
Symposium Chairman for "Aqueous Chemistry and Geochemical Cycles of Iron and Manganese", American Chemical Society meeting, Miami, Sept. 1989.  
Symposium Chairman for "Chemical Reactions at the Mineral/Water Interface", American Chemical Society meeting, Chicago, Sept. 1985.

**HONORS:**

**2001** Noted as author of one of the 10 most cited articles in journal history, *Environmental Science and Technology*.  
**2000** Distinguished Service Award, U.S. Dept. of the Interior, for outstanding scientific contributions

**Book Editing:**

- 1) Davis, J. A., and Hayes, K. F., (eds), 1986, *Geochemical Processes at Mineral Surfaces*, American Chemical Society Symposium Series, v. 323, 700 pages.
- 2) D. A. Naftz, S. J. Morrison, J. A. Davis, and C. C. Fuller (eds), 2002, *Groundwater Remediation of Trace Metals, Radionuclides, and Nutrients with Permeable Reactive Barriers*, Academic Press.

**Patents Held:**

Aquifer Remediation Barrier for Removal of Inorganic Contaminants, Patent no. 6,428,695 B1, Inventors: James Davis and Dave Naftz, August 2002.  
Deep Aquifer Remediation System, Patent No.6,458,271 B1, Inventors: Dave Naftz and James Davis, October 2002.

**JAMES A. DAVIS**  
**Publications**

1. Davis, J.A. and Jacknow, J., 1975. Heavy metals in three urban areas. *J. Water Pollution Control Federation*, 7, p. 2292.
2. Davis, J.A. and Leckie, J.O., 1978. Proceedings, 3rd Int. Sym. Environ. Biogeochem., 3, p. 1009-1024.
3. Davis, J.A., James, R.O. and Leckie, J.O., 1978. Surface ionization and complexation at the oxide/water interface. I. Computation of electrical double layer properties in simple electrolytes. *J. Colloid Interface Sci.*, 63, p. 480-499.
4. James, R.O., Davis, J.A. and Leckie, J.O., 1978. Computer simulation of the conductometric and potentiometric titrations of the surface groups on ionizable latexes. *J. Colloid Interface Sci.*, 65, p. 331-343.
5. Davis, J.A. and Leckie, J.O., 1978. Surface ionization and complexation at the oxide/water interface. II. Surface properties of amorphous iron oxyhydroxide and adsorption of metal ions. *J. Colloid Interface Sci.*, 67, p. 90-107.
6. Davis, J.A. and Leckie, J.O., 1978. Effect of adsorbed complexing ligands on trace metal uptake by hydrous oxides. *Environmental Sci. Tech.*, 12, p. 1309-1315.
7. Davis, J.A. and Leckie, J.O., 1979. Speciation of adsorbed Ions at the oxide/water interface. In *Chemical Modeling in Aqueous Systems*, E. A. Jenne, Ed., ACS Symposium Series 93, Ch. 15, p. 299-317.
8. Leckie, J.O. and Davis, J.A., 1979. Aqueous environmental chemistry of copper. In *Copper in the Environment, Part 1*. J. O. Nriagu, Ed., J. Wiley and Sons, p. 90-121.
9. Zurcher, F., Thuer, M. and Davis, J.A., 1980. Importance of particulate matter on the load of hydrocarbons of motorway runoff and secondary effluents. In *Hydrocarbons and Halogenated Hydrocarbons in the Aquatic Environment*, B. K. Afghan and D. Mackay, eds., Plenum Pub. Corp. p. 373-395.
10. Davis, J.A. and Leckie, J.O., 1980. Surface ionization and complexation at the oxide/water interface. III. Adsorption of Anions. *J. Colloid Interface Sci.*, 74, p. 32-43.
11. Davis, J.A. and Umana, A.F., 1980. Water supply, wastewater, and solid waste disposal in Costa Rica. Tech. Memo., Dept. of Civil Eng., Univ. of Costa Rica.
12. Davis, J.A., 1980. Adsorption of natural organic matter from freshwater environments by aluminum oxide. In *Contaminants and Sediments*, 2, R. A. Baker, Ed., Ann Arbor Science Pub. p. 279-304.

13. Davis, J.A. and Gloor, R., 1981. Adsorption of dissolved organics in lakewater by aluminum oxide: Effect of Molecular Weight. *Environmental Sci. Tech*, 15, p. 1223-1229.
14. Davis, J.A., 1982. Adsorption of natural dissolved organic matter at the oxide/water interface. *Geochimica Cosmochimica Acta*, 46, p. 2381-2393.
15. Luoma, S.N. and Davis, J.A., 1983. Requirements for modeling trace metal partitioning in oxidized estuarine sediments. *Marine Chemistry*, 12, p. 159-181.
16. Davis, J.A., 1984. Complexation of trace metals by adsorbed natural organic matter. *Geochimica Cosmochimica Acta*, 48, p. 679-671.
17. Clapper, D.L., Davis, J.A., Lamothe, P.J., Patton, C. and Epel, D., 1984. Involvement of zinc in the regulation of pH, motility, and acrosome reactions in sea urchin sperm. *J. Cell Biology*, 100 p. 1817-1824.
18. Kuwabara, J.S., Davis, J.A., and Chang, C.C.Y., 1985. Culturing *Selenastrum carpicornutum* in a synthetic algal nutrient media with defined particulates. *Hydrobiologia*, 124, p. 23-27.
19. Clapper, D.L., Lamothe, P.J., Davis, J.A. and Epel, D., 1985. Sperm mobility in the horseshoe crab. V. Zinc removal mediates chelator initiation of mobility. *J. of Experimental Zoology*, 236, p. 83-91.
20. Kuwabara, J.S., Davis, J.A., and Chang, C.C.Y., 1986. Algal growth response to particle-bound orthophosphate and zinc. *Limnology and Oceanography*, 31, p. 503-511.
21. Davis, J.A., and Hayes, K. F., 1986. Geochemical processes at mineral surfaces: An overview. In Davis, J. A., and Hayes, K. F., (eds) *Geochemical Processes at Mineral Surfaces*, American Chemical Society Symposium No. 323, p. 2-18.
22. Chang, C.C.Y., Davis, J.A., and Kuwabara, J.S., 1987. A study of metal ion adsorption at low suspended solid concentrations. *Estuarine and Coastal Shelf Science*, 24, p. 419-424.
23. Davis, J.A., Fuller, C.C., and Cook, A D., 1987. A model for trace metal sorption processes at the calcite surface: Adsorption of Cd and subsequent solid solution formation. *Geochimica Cosmochimica Acta*, 51, p. 1477-1490.
24. Fuller, C.C., and Davis, J.A., 1987. Processes and kinetics of Cd sorption by a calcareous aquifer sand. *Geochimica Cosmochimica Acta*, 51, p. 1491-1502.
25. Davis, J.A., Fuller, C.C., 1987. The roles of complexation and adsorption processes in toxic metal transport. In *Program Overview and Selected Papers from the Toxic Waste Program Technical Meeting: Tucson, March 1984*, US Geological Survey Open File Report 86-324, p. 107-116.
26. Gruebel, K.A., Davis, J.A., and Leckie, J.O., 1988. The feasibility of using sequential

- extraction techniques for As and Se in soils and sediments. *J. Soil Science Society of America*, 52, p. 390-397.
27. Dempsey, B., Davis, J.A., and Singer, P., 1988. A review of solid-solution interactions and implications for the control of trace inorganic materials in water treatment. *J. American Water Works Association*, 80, p. 56-64.
  28. Fuller, C.C., Davis, J.A., and Claypool-Frey, R.G., 1988. Desorption of arsenic from iron hydroxide precipitates in Whitewood Creek in US Geological Survey Applied Research Studies of the Cheyenne River System; K. E. Goddard, Ed., US Geological Survey Open-File Report 88-484, p. 118-147.
  29. Davis, J.A. and Hem, J.D., 1989. The surface chemistry of aluminum oxides and hydroxides. *The Environmental Chemistry of Aluminum* (G. Sposito, Ed.), CRC Press Inc, Ch. 7, p. 185-219.
  30. Kuwabara, J.S., Chang, C.C.Y., Cloern, J.E., Fries, T.L., Davis, J.A. and Luoma, S.N., 1989. Trace metal associations in the water column of South San Francisco Bay, California. *Estuarine, Coastal and Shelf Science*, 28, p. 307-325.
  31. Davis, J.A., Kent, D.B., and Rea, B.A., 1989. Field and laboratory studies of coupled flow and chemical reactions in the ground-water environment in Mallard, G. E., and Ragone, S. E. (eds). US Geological Survey Water-Resources Investigations report 88-4220, p. 189-198.
  32. Fuller, C.C., Davis, J.A., Zellwegger, G.W., and Goddard, K.E., 1989. Coupled chemical, biological and physical processes in Whitewood Creek, South Dakota: Evaluation of the controls of dissolved arsenic, in Mallard, G. E., and Ragone, S. E. (eds). US Geological Survey Water-Resources Investigations report 88-4220, p. 235-246.
  33. Fuller, C.C. and Davis, J.A., 1989. Influence of coupling of sorption and photosynthetic processes on trace element cycles in natural waters, *Nature*, 340, p. 52-54.
  34. Mehr, S.R., Eatough, D.J., Hanson, L.D., Lewis, E.A., and Davis, J.A., 1989. Calorimetry of heterogeneous systems:  $H^+$  binding to  $TiO_2$  in NaCl. *Thermochimica Acta* 154, p. 129-143.
  35. Davis, J.A., Fuller, C.C., Rea, B.A., and Claypool-Frey, R.G., 1989, Sorption and coprecipitation of arsenate by ferrihydrite: *Water-Rock Interaction* (D. L. Miles, ed.) Balkema, Rotterdam, p. 187-189.
  36. Kent, D.B., Davis, J.A., Maest, A.S., and Rea, B.A., 1989, Field and laboratory studies of transport of reactive solutes in groundwater: *Water-Rock Interaction*, (D. L. Miles, ed.) Balkema, Rotterdam, p. 381-383.
  37. Fuller, C.C., Davis, J.A., Cain, D.J., Lamothe, P.J., Fries, T.L., Fernandez, G., Vargas, J.A., and Murillo, M.M., 1990. Distribution and transport of sediment-bound metal contaminants in the Rio Grande de Tarcoles, Costa Rica (Central America), *Water Research*, 24, p.

805-812.

38. Davis, J.A., and Kent, D.B., 1990. Surface complexation modeling in aqueous geochemistry, in *Mineral-Water Interface Geochemistry* (M. F. Hochella and A. F. White, eds.), *Reviews in Mineralogy*, v. 23, Mineralogical Society of America, p. 177-260.
39. Davis, J.A., Kent, D.B., Rea, B.A., Garabedian, S.P., and Anderson, L.C.D., 1991. Effect of the geochemical environment on heavy metal transport in groundwater, in U. S. Geological Survey Toxic Substances Hydrology Program--Proceedings of the Technical Meeting, Monterey, California, March 11-15, 1991 (G. E. Mallard and D. A. Aronson, eds.), *Water Resources Investigations Report 91-4304*, p. 53-62.
40. Rea, B.A., Kent, D.B., LeBlanc, D.R., and Davis, J.A., 1991, Mobility of Zn in a sewage-contaminated aquifer, Cape Cod, Massachusetts, in U. S. Geological Survey Toxic Substances Hydrology Program--Proceedings of the Technical Meeting, Monterey, California, March 11-15, 1991 (G. E. Mallard and D. A. Aronson, eds.), *Water Resources Investigations Report 91-4304*, p. 88-95.
41. Kent, D.B., Davis, J.A., Anderson, L. D., and Rea, B.A., 1991. Transport of Zn in ground water in the presence of a strong complexing agent: Competing roles of sorption, complexation, and mineral dissolution, in U. S. Geological Survey Toxic Substances Hydrology Program--Proceedings of the Technical Meeting, Monterey, California, March 11-15, 1991 (G. E. Mallard and D. A. Aronson, eds.), *Water Resources Investigations Report 91-4304*, p. 78-83.
42. Davis, J. A., Waite, T. D., Kent, D.B., and Anderson, L.C.D., 1991. Reduction of Cr(VI) under mildly reducing conditions in a shallow, sand and gravel aquifer, in U. S. Geological Survey Toxic Substances Hydrology Program--Proceedings of the Technical Meeting, Monterey, California, March 11-15, 1991 (G. E. Mallard and D. A. Aronson, eds.), *Water Resources Investigations Report 91-4304*, p. 72-77.
43. Anderson, L.D., Kent, D.B., and Davis, J.A., 1991. Adsorption and reduction of Cr(VI) under oxic conditions: Studies of Cr(VI) reactions with sand from a shallow aquifer at Cape Cod, Massachusetts, in U. S. Geological Survey Toxic Substances Hydrology Program--Proceedings of the Technical Meeting, Monterey, California, March 11-15, 1991 (G. E. Mallard and D. A. Aronson, eds.), *Water Resources Investigations Report 91-4304*, p. 63-71.
44. Fuller, C.C., Coston, J.A., Hess, K.M., and Davis, J.A., 1991. Spatial heterogeneity of geochemical and hydrologic properties of subsurface materials in a sand and gravel aquifer, Cape Cod, Massachusetts, in U. S. Geological Survey Toxic Substances Hydrology Program--Proceedings of the Technical Meeting, Monterey, California, March 11-15, 1991 (G. E. Mallard and D. A. Aronson, eds.), *Water Resources Investigations Report 91-4304*, p. 84-87.
45. Kent, D.B., Davis, J.A., Anderson, L.D., and Rea, B.A., 1992. Ligand-enhanced transport of strongly adsorbing metal ions in the ground-water environment, *Proceedings of the 7th International Symposium on Water-Rock Interaction-- WRI-7*, Park City, Utah, Kharaka, Y.

K., and Maest, A. S., Eds, p. 805-808.

46. Coston, J.A., Fuller, C.C., and Davis, J.A., 1992. The search for a geochemical indicator of lead and zinc sorption in a sand and gravel aquifer, Falmouth, Massachusetts, USA., Proceedings of the 7th International Symposium on Water-Rock Interaction-- WRI-7, Park City, Utah, Kharaka, Y. K., and Maest, A. S., Eds, p. 41-44.
47. Anderson, L.C.D., Kent, D.A. and Davis, J.A., 1992. Reduction of Cr(VI) under mildly reducing conditions in a sand and gravel aquifer, Proceedings of the 7th International Symposium on Water-Rock Interaction-- WRI-7, Park City, Utah, Kharaka, Y. K., and Maest, A. S., Eds, p. 495-498.
48. Davis, J.A., Kent, D.B., Rea, B.A., Maest, A.S., and Garabedian, S.P., 1993. Influence of redox environment and aqueous speciation on metal transport in groundwater: Preliminary results of tracer injection studies, in Metals in Groundwater (H. E. Allan, E.M. Perdue, and D. S. Brown, Eds.), Lewis Publishers, p. 223-273.
49. Waychunas, G.A., Rea, B.A., Fuller, C.C., and Davis, J.A., 1993. Surface chemistry of ferrihydrite. I. EXAFS studies of the geometry of coprecipitated and adsorbed arsenate. *Geochimica Cosmochimica Acta*, 57, p. 2251-2269.
50. Fuller, C.C., Davis, J.A., and Waychunas, G.A., 1993. Surface chemistry of ferrihydrite: 2. Kinetics of arsenate adsorption and coprecipitation. *Geochimica Cosmochimica Acta*, 57, p. 2271-2282.
51. Davis, J.A., Fuller, C. C., Coston, J. A., Hess, K. M. and Dixon, E., 1993. Spatial heterogeneity of geochemical and hydrologic parameters affecting metal transport in groundwater. EPA/600/S-93/006. *Environmental Research Brief*, US EPA, Ada OK, 22 pages.
52. Davis, J.A., Kent, D.B., Coston, J.A., and Hess, K.A., Heavy-metal transport in a sand and gravel aquifer with variable chemical conditions, Cape Cod, Massachusetts, in U. S. Geological Survey Toxic Substances Hydrology Program--Proceedings of the Technical Meeting, Colorado Springs, Colorado September 20-24, 1993. (Morganwalp, D. W., and Aronson, D. A., Eds), Water Resources Investigations Report, v. 1, p. 219-225.
53. Fuller, C.C., Coston, J.A., Davis, J.A., and Dixon, E., Evaluation of geochemical indicators of metal adsorption in a sand and gravel aquifer, Cape Cod, Massachusetts, in U. S. Geological Survey Toxic Substances Hydrology Program--Proceedings of the Technical Meeting, Colorado Springs, Colorado September 20-24, 1993. (Morganwalp, D. W., and Aronson, D. A., Eds), Water Resources Investigations Report 94-4015, v. 1, p.227-234.
54. Rea, B.A., Kent, D.B., Anderson, L.C.D., Davis, J.A., and LeBlanc, D. R., The transport of inorganic contaminants from a sewage plume in the Cape Cod aquifer, Massachusetts, in U. S. Geological Survey Toxic Substances Hydrology Program--Proceedings of the Technical

- Meeting, Colorado Springs, Colorado September 20-24, 1993. (Morganwalp, D. W., and Aronson, D. A., Eds)., Water Resources Investigations Report, v. 1, p. 191-198.
55. Hess, K.M., Davis, J.A., Fuller, C.C., and Coston, J.A., Spatial variability of metal-ion adsorption and hydraulic conductivity in a sand and gravel aquifer, Cape Cod, Massachusetts, in U. S. Geological Survey Toxic Substances Hydrology Program-- Proceedings of the Technical Meeting, Colorado Springs, Colorado September 20-24, 1993. (Morganwalp, D. W., and Aronson, D. A., Eds)., Water Resources Investigations Report, v. 1, p. 235-242.
  56. Kent, D.B., Davis, J.A., Anderson, L.C.D., Rea, B.A., and Waite, T.D., 1994. Transport of chromium and selenium in the suboxic zone of a shallow aquifer: Influence of redox and adsorption reactions, *Water Resources Research*, 30, p 1099-1114.
  57. Anderson, L.D., Kent, D.B., and Davis, J.A., 1994. Batch experiments characterizing the reduction of Cr(VI) using suboxic material from a mildly reducing sand and gravel aquifer, *Environmental Science and Technology*, 28, p. 178-185.
  58. Rea, B.A., Davis, J.A., and Waychunas, G.A., 1994. Studies of the reactivity of the ferrihydrite surface by iron isotopic exchange and Mossbauer spectroscopy, *Clay and Clay Minerals*, 42, p. 23-34.
  59. Waite, T.D., Davis, J.A., Payne, T.E., Waychunas, G.A., and Xu, N., 1994. Uranium(VI) adsorption to ferrihydrite: Application of a surface complexation model. *Geochimica Cosmochimica Acta*, v. 58, p. 5465-5478.
  60. Payne, T.E., Davis, J.A., and Waite, T.D., 1994. Uranium retention by weathered schists-The role of iron minerals. *Radiochimica Acta*, v. 66/67, p. 297-303.
  61. Kent, D. B., Davis, J.A., Anderson, L.C.D., and Rea, B. A., 1995. Transport of chromium and selenium in a pristine sand and gravel aquifer: Role of adsorption process, *Water Resources Research*, v. 31, p. 1041-1050.
  62. Friedly, J.C., Davis, J.A., and Kent, D.B., 1995. Modeling hexavalent chromium reduction in field-scale transport and laboratory batch experiments. *Water Resources Research*, v. 31, p. 2783-2794.
  63. Gruebel, K.A., Davis, J.A., and Leckie, J.O., 1995. The kinetics of oxidation of selenite (Se IV) to selenate (Se VI) in the presence of oxygen, titania and light. *Environmental Science and Technology*, v. 29, p. 586-594.
  64. Coston, J.A., Fuller, C.C., and Davis, J.A., 1995. Pb<sup>2+</sup> and Zn<sup>2+</sup> adsorption by a natural Al- and Fe-bearing surface coating on an aquifer sand. *Geochimica et Cosmochimica Acta*, v. 59, p. 3535-3548.
  65. Goldberg, S., Davis, J. A., and Hem, J.D., 1995. The surface chemistry of aluminum oxides and

hydroxides. *The Environmental Chemistry of Aluminum* (G. Sposito, Ed.), 2nd Edition, CRC Press Inc, p. 271-331.

66. Waychunas, G. A., Xu, N., Fuller, C.C., Davis, J.A., and Bigham, J.M., 1995. XAS study of arsenate and selenate substituted schwertmannites. *Physica B*, 208, p. 481-483.
67. Waychunas, G.A., Davis, J.A., and Fuller, C.C., 1995. Geometry of sorbed arsenate on ferrihydrite and crystalline FeOOH: Re-evaluation of EXAFS results and topological factors in predicting sorbate geometry, and evidence of monodentate complexes. *Geochimica et Cosmochimica Acta*, v. 59, p. 3655-3661.
68. Waychunas, G.A., Fuller, C.C., Rea, B.A., and Davis, J.A., 1996. Wide angle X-ray scattering (WAXS) study of "two-line" ferrihydrite structure: Effect of arsenate sorption and counterion variation and comparison with EXAFS results, *Geochimica et Cosmochimica Acta*, v. 60, p. 1765-1782.
69. Fuller, C.C., Davis, J.A., Coston, J.A. and Dixon, E., 1996. Characterization of metal adsorption heterogeneity in a sand and gravel aquifer, Cape Cod, Massachusetts. *J. Contaminant Hydrology*, v. 22, p. 165-187.
70. Payne, T.E., Davis, J.A., and Waite, T.D., 1996. Uranium adsorption on ferrihydrite-Effects of phosphate and humic acid. *Radiochimica Acta*, v. 74, p. 239-243.
71. Kohler, M., Curtis, G.P., Kent, D.B. And Davis, J.A., 1996. Experimental investigation and modeling of uranium(VI) transport under variable chemical conditions. *Water Resources Research*, v. 32, no. 12, p. 3539-3551.
72. Kent, D.B., Davis, J.A., Anderson, L.C.D., Rea, B.A., and Coston, J.A., 2002. Effect of adsorbed metal contaminants on the transport of Zn- and Ni-EDTA complexes in a sand and gravel aquifer, *Geochimica et Cosmochimica Acta*, 66, 3017-3036.
73. Davis, J.A., Coston, J.A., Kent, D.B. and Fuller, C.C., 1998, Application of the surface complexation concept to complex mineral assemblages, *Environmental Science and Technology*, 32, p. 2820-2828.
74. Naftz, D.L., Davis, J.A., Fuller, C.C., Morrison, S.J., Freethey, G.W., Feltcorn, E.M., Wilhelm, R.G., Piana, M.J., Joye, J., and Rowland, R.C., 1999. Field Demonstrations of Permeable Reactive Barriers to Control Radionuclide and Trace-Element Contamination in Ground Water from Abandoned Mine lands, in U.S. Geological Survey Water-Resources Investigations Report 99-4018A, vol. 1, p. 281-288.
75. Bargar, J. R., Reitmeyer, R., and Davis, J. A., 1999. Spectroscopic confirmation of Uranium(VI)-carbonato adsorption complexes on hematite, *Environmental Science and Technology*, Vol. 33, No. 14, p. 2481-2484.
76. Davis, J.A., Hess, K.M., Coston, J.A, Kent, D.B., Joye, J.L., Brienens, P., and Campo, K.W.,

2001. Multispecies reactive tracer test in a sand and gravel aquifer, Cape Cod, Massachusetts, Part I. Experimental design and transport of bromide and nickel-EDTA tracers, EPA/600/R-01/007a, U.S. Environmental Protection Agency, Ada, OK, 38 p.
77. Davis, J. A., Hess, K.M., Kent, D. B., Coston, J. A., Joye, J. L., Brienens, P., and Campo, K. W., 2001, Multispecies reactive tracer test in a sand and gravel aquifer, Cape Cod, Massachusetts. Part II. Transport of chromium(VI) and lead-, copper-, and zinc-EDTA tracers, EPA/600/R-01/007b, U. S. Environmental Protection Agency, Ada, OK, 47 p.
78. Davis, J. A., Kent, D. B., Coston, J. A., Hess, K. M., and Joye, J. L., 1999, Multispecies Reactive Tracer Test in an Aquifer with Spatially Variable Chemical Conditions: An Overview, in U.S. Geological Survey Water-Resources Investigations Report 99-4018C, vol. 3, p. 383-392.
79. Hess, K. M, Davis, J. A., Coston, J. A., and Kent, D. B., 1999, Multispecies reactive transport in an aquifer with spatially variable chemical conditions: dispersion of bromide and nickel tracers, U.S. Geological Survey Water-Resources Investigations Report 99-4018C, p. 383-392.
80. Kent, D. B., Davis, J. A., Abrams, R. H., and Coston, J. A., 1999, Modeling the influence of adsorption on the fate and transport of metals in shallow ground water: Zn contamination in the sewage plume on Cape Cod, Massachusetts, U.S. Geological Survey Water-Resources Investigations Report 99-4018C, p. 361-369.
81. Nordstrom, D. K., Alpers, C. N., Coston, J. A., Taylor, H. E., McCleskey, R. B., Ball, J. W., Ogle, S., Davis, J. A., 1999, Geochemistry, toxicity, and sorption properties of contaminated sediments and pore waters from two reservoirs receiving acid mine drainage, in U.S. Geological Survey Water-Resources Investigations Report 99-4018A, p. 289-296.
82. Waychunas, G. A., Davis, J. A., and Reitmeyer, R., 1999, GIXAFS study of Fe(III) sorption and precipitation on natural quartz surfaces. *Journal of Synchrotron Radiation*, v. 6, p. 615-617.
83. Kent, D.B., Abrams, R.H., Davis, J.A., Coston, J.A, and LeBlanc, D.R., 2000, Modeling the influence of variable pH on the transport of zinc in a contaminated aquifer using semi-empirical surface complexation models, *Water Resources Research*, v. 36, p. 3411-3425.
84. Davis, J.A., Kent, D.B., Coston, J.A., Hess, K.M., and Joye, J.L., 2000, Multispecies reactive tracer test in an aquifer with spatially variable chemical conditions, *Water Resources Research*, v. 36, no. 1, p. 119-134.
85. Barger, J.R., Reitmeyer, R, Lenhart, J.J., and Davis, J.A., 2000, Characterization of U(VI)-carbonato ternary complexes on hematite: EXAFS and electrophoretic mobility measurements. *Geochimica et Cosmochimica Acta*, v. 64, no 16, p 2737-2749.

86. Zobrist, J., Dowdle, P.R., Davis, J.A., and Oremland, R.S., 2000, Mobilization of arsenite by dissimilatory reduction of adsorbed arsenate. *Environmental Science and Technology*, v. 34, no. 22, p. 4747-4753.
87. Lenhart, J. J., Bargar, J.R., and Davis, J.A., 2001, Spectroscopic evidence for ternary surface complexes in the lead(II)-malonic acid-hematite system, *J. Colloid Interface Sci.*, v. 234, p. 448-452.
88. Waite, T.D., Davis, J.A., Fenton, B.R., and Payne, T.E., 2000, Approaches to modelling uranium(VI) adsorption on natural mineral assemblages: *Radiochimica Acta*, v. 88, p. 687-693.
89. Friedly, J.C., Kent, D.B., and Davis, J.A., 2002, Simulation of the mobility of metal-EDTA complexes in groundwater: The influence of contaminant metals, *Environmental Science and Technology*, 36, 355-363.
90. Davis, J.A. (ed.), 2001, *Surface Complexation Modeling of Uranium(VI) Adsorption on Natural Mineral Assemblages*, NUREG/CR-6708, U.S. Nuclear Regulatory Commission, Washington, D.C., 214 pp.
91. Fuller, C.C., Bargar, J.R., Davis, J.A., and Piana, M.J., 2002, Mechanisms of uranium interactions with hydroxyapatite: Implications for ground-water remediation, *Environmental Science and Technology*, 36, 158-165.
92. Hess, K.M., Davis, J.A., Kent, D.B., and Coston, J.A., 2002, Multispecies reactive tracer test in an aquifer with spatially variable chemical conditions: 2. Dispersive transport of bromide and nickel, *Water Resources Research*, 38(8), 10.1029/2001WR000945.
93. Waychunas, G.A., Fuller, C.C., Davis, J.A., 2002, Surface complexation and precipitate geometry for aqueous Zn(II) sorption on ferrihydrite: I. EXAFS analysis, *Geochimica et Cosmochimica Acta*, 66, 1119-1138.
94. Fuller, C.C., Piana, M.J., Bargar, J.R., Davis, J.A., and Kohler, M., 2002, Evaluation of apatite materials for use in permeable reactive barriers for the remediation of uranium-contaminated groundwater, in *Handbook of Groundwater Remediation using Permeable Reactive Barriers: Applications to Radionuclides, Trace Metals, and Nutrients*, D.A., Naftz, S.J. Morrison, J.A. Davis, and C.C. Fuller (eds)., Academic Press, p. 255-280.
95. Naftz, D.L., Fuller, C.C., Davis, J.A., Morrison, S.J., Feltcorn, E.M., Rowland, R.C., Freethey, G.W., Wilkowske, C., and Piana, M., 2002, Field demonstration of three permeable reactive barriers to control uranium contamination in ground water, Fry Canyon, Utah, in *Handbook of Groundwater Remediation using Permeable Reactive Barriers: Applications to Radionuclides, Trace Metals, and Nutrients*, D.A. Naftz, S.J. Morrison, J.A. Davis, and C.C. Fuller (eds)., Academic Press, 401-434.

96. Joye, J.L., Naftz, D.L., Davis, J.A., Freethey, G.W., and Rowland, R.C., 2002, Development and performance of an iron oxide/phosphate reactive barrier for the remediation of uranium-contaminated groundwater, in *Handbook of Groundwater Remediation using Permeable Reactive Barriers: Applications to Radionuclides, Trace Metals, and Nutrients*, D.A. Naftz, S.J. Morrison, J.A. Davis, and C.C. Fuller (eds.), Academic Press, p. 195-219.
97. Naftz, D.L., Fuller, C.C., Davis, J.A., Piana, M.J., Morrison, S.J., Freethey, G.W., and Rowland, R.C., 2000, Field demonstration of permeable reactive barriers to control uranium contamination in ground water, in *Chemical Oxidation and Reactive Barriers: Remediation of Chlorinated and Recalcitrant Compounds*, G.B. Wickramanayake, A.R. Gavaskar, and A. Chen (eds.), Battelle Press, Columbus, OH, pp. 282-289.
98. Davis, J. A., Payne, T.E., and Waite, T.D., 2002, Simulating the pH and pCO<sub>2</sub> dependence of uranium(VI) adsorption by a weathered schist with surface complexation models, in *Geochemistry of Soil Radionuclides*, Soil Science Society of America, Madison, WI, Chap. 4, p. 61-86.
99. Davis, J.A., 2002, Molecular scale observations and models of sorption reactions, in *Radionuclide Retention in Geologic Media, Workshop Proceedings, 5<sup>th</sup> Geotrap Workshop on Geological Evidence and Theoretical Bases for Radionuclide-Retention Processes in Heterogeneous Media*, Oskershamn, Sweden, May 7-9, 2001, Nuclear Energy Agency (OECD), Paris, p. 71-80.
100. Waychunas, G.A., Rehr, J.J, Fuller, C.C., and Davis, J.A., 2003, Surface complexation and precipitate geometry for aqueous Zn(II) sorption on ferrihydrite: II. XANES analysis, *Geochimica et Cosmochimica Acta*, 67, 1031-1043.
101. Freethey, G., Naftz, D.L., Rowland, R., and J. A. Davis, 2002, Deep Aquifer Remediation Tools: Theory, Design, and Performance Modeling, in *Handbook of Groundwater Remediation using Permeable Reactive Barriers: Applications to Radionuclides, Trace Metals, and Nutrients*, D.A. Naftz, S.J. Morrison, J.A. Davis, and C.C. Fuller (eds.), Academic Press, p. 133-161.
102. Morrison, S. J., Naftz, D.L., Davis, J.A., and Fuller, C.F., 2002, Introduction to groundwater remediation of metals, radionuclides, and nutrients, with permeable reactive barriers, in *Handbook of Groundwater Remediation using Permeable Reactive Barriers: Applications to Radionuclides, Trace Metals, and Nutrients*, D.A. Naftz, S.J. Morrison, J.A. Davis, and C.C. Fuller (eds.), Academic Press, p. 1-15.
103. Hoehn, R., Isenbeck-Schroeter, M., Niedan, V., Scholz, C., Tretner, A., Jann, S., Stadler, S., Kent, D.B., Davis, J.A., and Jakobsen, R., 2001, Tracer test with arsenic(V) in an iron-reducing environment at the USGS Cape Cod Site (Mass., USA), in Cidu, R. ed. *Water-Rock Interaction 2001*: Lisse, Italy, Balkema, p. 1099-1102.
104. Stadler, S., Jann, S., Hoehn, R., Isenbeck-Schroeter, M., Niedan, V., Scholz, C., Tretner, A., Davis, J.A., and Kent, D.B., 2001, Tracer tests with As(III) in the oxic and suboxic

- groundwater zones at the USGS Cape Cod site, Mass., USA, in Cidu, R. ed. : Lisse, Italy, Balkema, p. 1013-1016.
105. Curtis, G.P., Fox, P., Kohler, M., and Davis, J. A., 2004, Comparison of field uranium  $K_d$  values with a laboratory determined surface complexation model, *Applied Geochemistry*, 19, 1643-1653.
  106. Davis, J.A. and Curtis, G.P., eds, 2003, *Application of Surface Complexation Modeling to Describe Uranium(VI) Adsorption and Retardation at the Uranium Mill Tailings Site at Naturita, Colorado*, Report NUREG CR-6820, U. S. Nuclear Regulatory Commission, Rockville, MD, 223 pp. Available at:  
<http://www.nrc.gov/reading-rm/doc-collections/nuregs/contract/cr6820/cr6820.pdf>
  107. Fuller, C. C., J. R. Bargar, and J. A. Davis, 2003, Molecular-scale characterization of uranium sorption by bone apatite materials for a permeable reactive barrier demonstration, *Environmental Science and Technology*, v. 37, no. 20, p 4642-4649.
  108. Arai, Y., Lanzirotti, A., Sutton, S., Davis, J.A., and Sparks, D.L., 2003, Arsenic speciation and reactivity in poultry litter: *Environmental Science and Technology*, v. 37, p. 4,083-4,090.
  109. Arai, Y., Sparks, D.L., and Davis, J.A., 2004, Effects of dissolved carbonate on arsenate adsorption and surface speciation at the hematite-water interface: *Environmental Science and Technology*, v. 38, p. 817-824.
  110. Kohler, M., Meece, D.M., Curtis, G.P., and Davis, J.A., 2004, Methods for estimating adsorbed uranium(VI) and distribution coefficients in contaminated sediments, *Environmental Science and Technology*, 38, 240-247.
  111. Davis, J.A., Meece, D.M., Kohler, M., and Curtis, G. P., 2004, Approaches to surface complexation modeling of uranium(VI) adsorption on aquifer sediments, *Geochimica Cosmochimica Acta*, v. 68, p. 3621-3641.
  112. Payne, T.E., Davis, J.A., Ochs, M., Olin, M. and Tweed, C.J., 2004, Uranium adsorption on weathered schist – Intercomparison of modeling approaches, *Radiochimica Acta*, 92, 651-661.
  113. Bargar, J.R., Kubicki, J.D., Reitmeyer, R., and Davis, J.A., 2005, ATR-FTIR characterization of inner-sphere and outer-sphere carbonate surface complexes on hematite, *Geochimica Cosmochimica Acta*, 69, 1527-1542.
  114. Fuller, C.C., and Davis, J.A., 2003, Evaluation of the processes controlling dissolved arsenic in Whitewood Creek, South Dakota, U.S. Geological Survey Professional Paper 1681, p. 27-48.

115. Davis, J.A., Ochs, M., Olin, M., Payne, T.E., and Tweed, C.J., 2005, Interpretation and Prediction of Radionuclide Sorption onto Substrates Relevant for Radioactive Waste Disposal using Thermodynamic Sorption Models, NEA Sorption Project, Phase II, NEA Report 5992, OECD, Paris, 285 pp.
116. Davis, J.A., Yabusaki, S.B., Steefel, C.I., Zachara, J.M., Curtis, G.P., Redden, G.D., Criscenti, L.J., and Honeyman, B.D., 2004, *EOS*, Assessing conceptual models for subsurface reactive transport of inorganic contaminants, 85, 449-455.
117. Payne, T.E., Davis, J.A., Lumpkin, G.R, Chisari, R., and Waite, T.D., 2004, Surface complexation model of uranyl sorption on Georgia kaolinite, *Applied Clay Science*, 26, 151-162.
118. Arai, Y., Sparks, D.L., and Davis, J.A., 2005, Arsenate adsorption mechanisms at the allophane-water interface, *Environmental Science and Technology*, 39, 2537-2544.
119. Amirbahman, A., Kent, D.B., Curtis, G.P., and Davis, J.A., 2006, Kinetics of sorption and abiotic oxidation of arsenic(III) by aquifer materials, *Geochimica et Cosmochimica Acta*, 70, 533-547.
120. Höhn, R., Isenbeck-Schröter, M., Kent, D.B., Davis, J.A., Jakobsen, R., Jann, S., Niedan, V., Scholz, C., Stadler, S., Tretner, A., 2006, Tracer test with As(V) under variable redox conditions controlling arsenic transport in the presence of elevated ferrous concentrations, *J. Contaminant Hydrology*, 88, 36-54.
121. Fox, P.M., Davis, J.A., and Zachara, J.M, 2006, The effect of calcium on aqueous uranium (VI) speciation and adsorption to ferrihydrite and quartz, *Geochimica et Cosmochimica Acta*, 70, 1379-1387.
122. Davis, J.A., Curtis, G.P., Wilkins, M.J., Kohler, M., Fox, P.M., Naftz, D.L., and Lloyd, J.R., 2006, Processes affecting transport of uranium in a suboxic aquifer, *Physics and Chemistry of the Earth*, 31, 548-555.
123. Arai, Y., McBeath, M., Bargar, J.R., Joye, J., and Davis, J.A., 2006, Uranyl adsorption and surface speciation at the imogolite-water interface: Self-consistent spectroscopic and surface complexation models, *Geochimica et Cosmochimica Acta*, 70, 2492-2509.
124. Curtis, G. P., J. A. Davis, and D. L. Naftz, 2006, Simulation of reactive transport of uranium(VI) in groundwater with variable chemical conditions, *Water Resources Research*, 42, W04404, doi:10.1029/2005WR003979.
125. Davis, J.A. and Curtis, G.P., 2007, *Consideration of Geochemical Issues in Groundwater Restoration at Uranium In-Situ Leach Mining Facilities*, Report NUREG CR-6870, U. S. Nuclear Regulatory Commission, Rockville, MD, 111 pp.

126. Zachara J.M., Davis J.A., Liu C., McKinley, J.P., Qafoku N., Wellman D.M., Yabusaki S., 2005, Uranium geochemistry in vadose zone and aquifer sediments from the 300 Area uranium plume, Rept. PNNL-15121, U.S. Department of Energy, Washington, D.C.
127. Waychunas, G., Trainor, T., Eng, P., Catalano, J., Brown, G., Davis, J.A., Rogers J., and Bargar, J., 2005, Surface complexation studied via combined grazing-incidence EXAFS and surface diffraction: Arsenate on hematite (0001) and (10–12), *Analytical and Bioanalytical Chemistry*, v. 383, p 12-27.
128. Curtis, G.P. and Davis, J.A., eds., 2006, *Tests of Uranium(VI) Adsorption Models in a Field Setting*, Report NUREG CR-6911, U. S. Nuclear Regulatory Commission, Rockville, MD, 99 pp.
129. Kent, D.B., Wilkie, J.A., and Davis, J.A., 2007, Modeling the movement of a pH perturbation and its impact on adsorbed zinc and phosphate in a wastewater-contaminated aquifer, *Water Resources Research*, 43, W07440, doi:10.1029/2005WR004841.
130. Bond, D.L., Davis, J.A., and Zachara, J.M., 2008, Uranium(VI) release from contaminated vadose zone sediments: Estimation of potential contributions from dissolution and desorption, in *Adsorption of Metals to Geomedia II: Variables, Mechanisms, and Model Applications*, eds. M.O. Barnett and D.B. Kent, Elsevier, p. 375-416.
131. Arai, Y., Marcus, M.A., Tamura, N., Davis, J.A., and Zachara, J.M., 2007, Spectroscopic evidence for uranium bearing precipitates in vadose zone sediments at the Hanford 300-area site, *Environmental Science and Technology*, 41, 4633-4639.
132. Goldberg, S., Criscenti, L.J., Turner, D.R., Davis, J.A., and Cantrell, K.J., 2007, Adsorption-desorption processes in subsurface reactive transport modeling, *Vadose Zone Journal*, 6, 407-435.
133. Arai, Y., Moran, P.B., Honeyman, B.D., and Davis, J.A., 2007, In situ spectroscopic evidence for neptunium(V)-carbonate inner-sphere and outer-sphere ternary surface complexes on hematite surfaces, *Environmental Science and Technology*, 41, 3940-3944.
134. Welch, A.H, Oremland, R.S., Davis, J.A., and Watkins, S.A., 2006, Arsenic in groundwater: A review of current knowledge and relation to the CalFed solution area with recommendations for needed research, *San Francisco Estuary and Watershed Science*, Vol. 4, Issue 2, Article 4, pp. 1-32.
135. Kent, D.B., Davis, J.A., Joye, J.L., and Curtis, G.P., 2008, Influence of variable chemical conditions on EDTA-enhanced transport of metal ions in mildly acid groundwater, *Environmental Pollution*, 153, 44-52.
136. Payne, T.E., Davis, J.A., Ochs, M., Olin, M., Tweed, C.J., Altmann, S., and Askarieh, M., 2006, Comparative evaluation of surface complexation models for radionuclide uptake by diverse geologic materials. In: *Surface Complexation Modelling* (J. Lutzenkirchen, Ed.),

- Elsevier, Amsterdam, pp 605-633. Volume 11 in the 'Interface Science and Technology' series.
137. Davis, J.A., 2008, *Application of Surface Complexation Modeling to Selected Radionuclides and Aquifer Sediments*, Report NUREG CR-6959, U. S. Nuclear Regulatory Commission, Rockville, MD, 114 pp.
  138. Stubbs, J.E., Veblen, L.A., Elbert, D.C., Zachara, J.M., Davis, J.A., and Veblen, D.R., 2009, Newly recognized hosts for uranium in the Hanford Site vadose zone, *Geochimica et Cosmochimica Acta*, 73, 1563-1576.
  139. Zachara J.M., Liu C., Brown, C., Kelly, S., Christensen, J., McKinley, J., Davis, J.A., Serne, J., Dresel, E., and Um, W., 2007, A site-wide perspective on uranium geochemistry at the Hanford Site, Rept. PNNL-17031, U.S. Department of Energy, Washington, D.C.
  140. Curtis, G.P., Davis, J.A., and Kohler, M., 2009, Comparing approaches for simulating the reactive transport of U(VI) in ground water, *Mine Water and the Environment*, 28, 84-93.
  141. Fox, P.M., Davis, J.A., and Luther, G.W., 2009, The kinetics of iodide oxidation by the manganese oxide mineral birnessite, *Geochimica Cosmochimica Acta*, 73, 2850-2861.
  142. Hyun, S.P., Fox, P.M., Davis, J.A., Campbell, K.M., Hayes, K.F., and Long, P.E., 2009, Surface complexation modeling of U(VI) adsorption by aquifer sediments from a former mill tailings site at Rifle, Colorado, *Environmental Science and Technology*, 43, 9368-9373.
  143. Davis, J.A. and Fox, P.M., 2009, *Redox and Sorption Reactions of Iodine and Cesium During Transport Through Aquifer Sediments*, Report NUREG CR-6977, U. S. Nuclear Regulatory Commission, Rockville, MD, 33 pp.
  144. Fox, P.M., Kent, D.B., and Davis, J.A., 2010, Redox transformations and transport of cesium and iodide in two geochemically distinct zones of a sand and gravel aquifer, *Environmental Science and Technology*, 44, 1940-1946.
  145. Williams, K.H., Long, P.E., Davis, J.A., Wilkins, M.J., N'Guessan, L., Steefel, C.I., Yang, L., Newcomer, D., Spane, F.A., Kerkhof, L.J., McGuinness, L., Dayvault, R., and Lovley, D.R., 2011, Acetate availability and its influence on sustainable bioremediation of uranium-contaminated groundwater, *Geomicrobiology Journal*, 28:5-6, 519-539.
  146. Zhang, S., Kent, D.B., Elbert, D.C., Zhi, S., Davis, J.A., and Veblen, D.R., 2011, Mineralogy, morphology, and textural relationships in coatings on quartz grains in sediments in a quartz-sand aquifer, *J. Contaminant Hydrology*, 124, 57-67.
  147. Greskowiak, J., Hay, M.B., Prommer, H., Liu, C., Post, V.E.A., Ma, R., Davis, J.A., Zheng, C., and Zachara, J.M., 2011, Simulating multi-rate mass-transfer and sorption of U(VI) under transient groundwater flow and hydrochemistry - Physical versus chemical non-equilibrium model, *Water Resources Research*, 47, W08501, doi:10.1029/2010WR010118.

148. Hay, M.B., Stoliker, D.L., Davis, J.A., and Zachara, J.M., 2011, Characterization of the intragranular water regime within subsurface sediments: Pore volume, surface area, and mass transfer limitations, *Water Resources Research*, 47, W10531, doi:10.1029/2010WR010303.
149. Dong, W., Tokunaga, T.K., Davis, J.A., and Wan, J., 2012, Uranium(VI) sorption and surface complexation modeling onto background sediments from the F-area, Savannah River site, *Environmental Science and Technology*, 46, 1565-1571.
150. Hyun, S.P., Davis, J.A., Sun, K., and Hayes, K.F., 2012, Uranium(VI) reduction by Fe(II) monosulfide, mackinawaite, *Environmental Science and Technology*, 46, 3369-3376.
151. Fox, P.M., Davis, J.A., Hay, M.B., Conrad, M.E., Campbell, K.M., Williams, K.H., and Long, P.E., 2012, Rate-Limited U(VI) Desorption during a Small-Scale Tracer Test in a Heterogeneous Uranium Contaminated Aquifer, *Water Resources Research*, 48, W05512, doi:10.1029/2011WR011472.
152. Campbell, K.M., Kukkadapu, R.K., Qafoku, N.P., Peacock, A.D., Leshner, E., Williams, K.H., Bargar, J.R., Wilkins, M.J., Icenhower, J.P., Figueroa, L., Ranville, J., and Davis, J.A., 2012, Microbiological, mineralogical and geochemical characteristics of a naturally reduced zone in a uranium-contaminated aquifer, *Applied Geochemistry*, 27, 1499-1511.
153. Stoliker, D.L., Kaviani, N., Kent, D.B., and Davis, J.A., 2013, Evaluating ion exchange resin efficiency and oxidative capacity for the separation of uranium(IV) and uranium(VI), *Geochemical Transactions*, 14:1-8.
154. Payne, T.E., V. Brendler, M. Ochs, B. Baeyens, P.L. Brown, J.A. Davis, C. Ekberg, D.A. Kulik, J. Lutzenkirchen, T. Missana, Y. Tachi, L.R. Van Loon, and S. Altmann, 2013, Guidelines for thermodynamic sorption modeling in the context of radioactive waste disposal, *Environmental Modelling and Software*, 42, 143-156.
155. Bargar, J.R., K.H. Williams, K.M. Campbell, P.E. Long, J.E. Stubbs, E. Suvorova, J. Lezama-Pacheco, D.S. Alessi, M. Stylo, S.M. Webb, J.A. Davis, D.E. Giammar, L.Y. Blue, and R. Bernier-Latmani, 2013, Uranium redox transition pathways in acetate-amended sediments, *Proceedings National Academy of Sciences*, 110, 4506-4511.
156. Zachara, J.M., J.R. Bargar, J.A. Davis, P.M. Fox, J. Fredrickson, M.D. Freshley, A. Konopka, C. Liu, J.P. McKinley, M. Rockhold, K.H. Williams, and S.B. Yabusaki, 2013, Persistence of groundwater uranium plumes: Contrasting mechanisms at two DOE sites in the groundwater-river interaction zone, *J. Contaminant Hydrology*, 147, 45-72.
157. Tinnacher, R.M. and Davis, J.A., 2013, Effects of chemical solution conditions on uranium(VI) diffusion in clays, *Proceedings, International High-Level Radioactive Waste Management Conference, April 28-May 2, 2013, Albuquerque, NM*, p. 867-874.

158. Tinnacher, R.M, Nico, P.S. Davis, J.A., and Honeyman, B.D., 2013, Effects of fulvic acid on U(VI) sorption kinetics, *Environmental Science and Technology*, 47, 6214-6222.
159. Fox, P.M., Davis, J.A., Kukkadapu, R., Singer, D.M., Bargar, J.R., and Williams, K.H., 2013, Abiotic U(VI) reduction by sorbed Fe(II) on natural sediments, *Geochimica Cosmochimica Acta*, 117, 266-282.
160. Stoliker, D.L., Campbell, K.M., Fox, P.M., Singer, D.M., Kaviani, N., Carey, M., Peck, N.E., Bargar, J.R., Kent, D.B., and Davis, J.A., 2013, Evaluating chemical extraction techniques for the determination of uranium oxidation state in reduced aquifer sediments, *Environmental Science and Technology*, 47, 9225-9232.
161. Singer, D.M., Fox, P.M., Guo, H., Marcus, M.A., and Davis, J.A., 2013, Sorption and redox reactions of As(III) and As(V) within secondary mineral coatings on aquifer sediment grains, *Environmental Science and Technology*, 47, 11569-11576.
162. Long, P.E., Williams, K.H., Davis, J.A., Fox, P.M., Wilkins, M.J., Yabusaki, S.B., Fang, Y., Waichler, S., Berman, E.S.F., Gupta, M., Chandler, D.P., Murray, C., Peacock, A., Giloteaux, L., Lovley, D.R., and Banfield, J.F., 2015, Bicarbonate impact on U(VI) bioreduction rates in a shallow alluvial aquifer, *Geochimica Cosmochimica Acta*, 150, 106-124.
163. Hyun, S.P., Davis, J.A., and Hayes, K.F., 2014, Abiotic reduction of U(VI) by aqueous sulfide, *Applied Geochemistry*, 50, 7-15.
164. Alessi, D.S., Lezama-Pacheco, J.S., Janot, N., Suvorova, E.I., Cerrato, J.M., Giammar, D.E., Davis, J.A., Fox, P.M., Williams, K.H., Long, P.E., Handley, K.M., Bernier-Latmani, R., and Bargar, J.R., 2014, Speciation and reactivity of uranium products formed during in situ bioremediation in a shallow alluvial aquifer, *Environmental Science and Technology*, 48, 12842-12850.
165. Singer, D.M., Guo, H., and Davis, J.A., 2014, U(VI) and Sr(II) batch sorption and diffusion kinetics into mesoporous silica (MCM-41), *Chemical Geology*, 390, 152-163.
166. Borisover, M. and Davis, J.A., 2015, Sorption of inorganic and organic solutes by clay minerals, in *Natural and Engineered Clay Barriers, Developments in Clay Science, Vol. 6C*, Tournassat, C., Steefel, C. Bourg, I., and Bergaya (eds.), Elsevier, Chap. 2, pp. 33-70.
167. Tinnacher, R., Holmboe, M., Tournassat, C., Bourg, I.C., and Davis, J.A., 2016, Ion adsorption and diffusion in smectite clay barriers: molecular, pore, and continuum scale views, *Geochim. Cosmochim. Acta*, 177, 130-149.
168. Saldi, G.D., Daval, D., Guo, H., Guyot, F., Bernard, S., Le Guillou, C., Davis, J.A., and Knauss, K.G., 2015, Mineralogical evolution of Fe-Si-rich layers at the olivine-water interface during carbonation reactions, *American Mineralogist*, 100, 2655-2669.

169. Yuan, X., Davis, J. A., and Nico, P.S., 2016, Iron-mediated oxidation of methoxyhydroquinone under dark conditions: kinetic and mechanistic insights, *Environmental Science and Technology*, 50, 1731-1740.
170. Hafeznezami, S., Zimmer-Faust, A.G., Dunne, A., Tran, T, Yang, C.C., Lam, J.R., Reynolds, M.D., Davis, J.A., and Jay, J.A., 2016, Adsorption and desorption of arsenate on sandy sediments from contaminated and uncontaminated saturated zones: Kinetic and equilibrium Modeling, *Environmental Pollution*, 215, 290-301. [doi:10.1016/j.envpol.2016.05.029](https://doi.org/10.1016/j.envpol.2016.05.029)
171. Rawson, J., Prommer, H., Siade, A., Jackson, C., Berg, M., Davis, J.A., and Fendorf, S., 2016, Numerical modeling of arsenic mobility during reductive iron-mineral transformations, *Environmental Science and Technology*, 50, 2459-2467.
172. Hafeznezami, S., Lam, J.R., Xiang, Y., Reynolds, M.D., Davis, J.A., Lin, T., and Jay, J.A., 2016, Arsenic mobilization in an oxidizing alkaline groundwater: Experimental studies, comparison and optimization of geochemical modeling parameters, *Applied Geochemistry*, 72, 97-112.
173. Tournassat, C.; Davis, J.A.; Chiaberge, C.; Grangeon, S.; Bourg, I., 2017, Modeling the acid-base properties of montmorillonite edge surfaces, *Environmental Science and Technology*, in press.
174. Yuan, X.; Nico, P.S.; Huang X.; Williams, K. H.; Davis, J. A., 2017, Dark production of hydrogen peroxide in groundwater at Rifle, Colorado, *Environmental Science and Technology*, submitted.