

CURRICULUM VITAE

Donald L. Sparks

S. Hallock du Pont Chair in Soil and Environmental Chemistry and

Director, Delaware Environmental Institute

I. Education

- A. B.S. Agronomy 1975, University of Kentucky, Lexington, Kentucky
- B. M.S. Soil Science 1976, University of Kentucky, Lexington, Kentucky
M.S. Thesis - "Physical, mineralogical, and chemical properties, including ammonium distribution, in the Shrouds soils of Kentucky"
- C. Ph.D. Soil Science 1979, Virginia Polytechnic Institute and State University, Blacksburg, Virginia
Ph.D. Dissertation "Potassium adsorption and desorption kinetics in a soil system and its relation to plant uptake"

II. Experience in Higher Education

- A. Undergraduate and Graduate Experience:
 - 1. Laboratory Assistant - 1975-1976, Soil Science
 - 2. Graduate Research Fellow in Soil Science - 1976-1979
- B. Faculty Appointments:
 - 1. Assistant Professor of Soil Chemistry, University of Delaware, Newark, Delaware - July, 1979 - June 1983
 - 2. Associate Professor of Soil Chemistry, University of Delaware, Newark, Delaware - July, 1983 - June, 1987
 - 3. Professor of Soil Chemistry, University of Delaware, Newark, Delaware - July, 1987 -
 - 4. Professor of Civil and Environmental Engineering, University of Delaware, Newark, Delaware - July, 1992 -
 - 5. Distinguished Professor of Soil Science, University of Delaware, Newark, Delaware - July, 1994 - June, 2001
 - 6. Francis Alison Professor, University of Delaware, Newark, Delaware

September, 1996 –

7. Professor of Chemistry and Biochemistry, University of Delaware, Newark, Delaware - September, 1997 –
8. Professor of Marine Studies, University of Delaware, Newark, Delaware - December, 1999 –
9. T. A. Baker Professor, University of Delaware, Newark, Delaware September, 2001-2002
10. S. Hallock du Pont Chair, University of Delaware, Newark, Delaware - September, 2002-

C. Visiting Professorships:

1. Visiting Associate Professor of Soil Physical Chemistry, University of California, Riverside, California - December, 1985-April, 1986
2. Visiting Professor of Soil and Environmental Chemistry, INRA, Paul Cezanne University and University of Marseille, Aix-en-Provence, France, August 2005

D. Administrative Appointments

1. Assistant Chairperson, Department of Plant Science, University of Delaware, 1984 - 1985
2. Chairperson, Department of Plant and Soil Sciences, University of Delaware, 1989 -2008
3. Director, Center for Critical Zone Research, 2006- 2009
4. Director, Delaware Environmental Institute, 2009 -
5. Lead Principal Investigator, Christina River Basin Critical Zone Observatory, 2009 –
6. NSF EPSCoR Principal Investigator and Project Director for DE EPSCoR Program, 2005-
7. Chairperson, U.S. National Committee for Soil Science (USNC/SS) 2013-2016

E. Professional Appointments

- 1987 Chair-Elect, Div. S-2 (Soil Chemistry), Soil Science Society of America
- 1994 Elected Vice-Chair, Commission II (Soil Chemistry), International Society of Soil Science

- 1998 President-Elect, Soil Science Society of America
- 1998 Elected Chair, Commission II (Soil Chemistry), International Union of Soil Science
- 1999 President, Soil Science Society of America
- 2000 President-Elect, International Union of Soil Sciences
- 2000 Member, National Research Council/National Academy of Sciences, U.S. Committee for Soil Science
- 2001-2002 - National Research Council/National Academy of Sciences Committee on Biosolids Applied to Land
- 2002 President, International Union of Soil Sciences
- 2002 Scientific Advisory Board, Advanced Light Source, Lawrence Berkeley National Laboratory
- 2003 SUNY-Stony Brook Molecular Environmental Science Institute
- 2004 Review Panel for Environmental Sciences Department at Swiss Federal Institute of Technology (ETH), May 2-7, 2004.
- 2008 Executive Committee, American Geological Institute
- 2008 American Geological Foundation Trustee

XI. Professional Honors and Awards

Sigma Xi Award from Virginia Polytechnic Institute and State University for Outstanding Ph.D. dissertation in Physical Sciences

- 1983 Sigma Xi Distinguished Scientist Award from Univ. of Delaware
- 1983 Nominated for Presidential Young Investigator Award, The National Science Foundation
- 1984 Cited by International Potash Institute for Outstanding Research on Soil Potassium
- 1985 American Society of Agronomy Visiting Scientist Award
- 1986 Research Award, Northeastern Branch, American Society of Agronomy
- 1989 Fellow, Soil Science Society of America
- 1989 Fellow, American Society of Agronomy

1991 F.D. Chester Distinguished Performance Award - College of Agricultural Sciences

1991 M.L. and Chrystie M. Jackson Soil Science Award

1993 Who's Who in America, American Men in Science

1994 Named 1st Distinguished Professor in the College of Agricultural Sciences

1994 Soil Science Research Award, Soil Science Society of America

1995 American Men and Women of Science

1996 Recipient of the University of Delaware Francis Alison Award

1998 Fellow, American Association for the Advancement of Science

2001 Sir Frederick McMaster Visiting Lecturer Fellowship, CSIRO, Australia

2001 T.A. Baker Professor in Plant and Soil Sciences

2002 University of Kentucky Gamma Sigma Delta Chapter Outstanding Alumnus Award

2002 University of Delaware Doctoral Student Advising and Mentoring Award

2002 S. Hallock du Pont Chair in Plant and Soil Sciences

2003 Gold Medal for Distinguished Research Achievements, Polish Society of Soil Science

2003 American Society of Agronomy Environmental Quality Research Award

2004 Roscoe Ellis, Jr. Memorial Lecturer, Kansas State University

2005 Sterling B. Hendricks Memorial Lecturer and Medal, USDA/ARS

2007 Distinguished Alumnus, University of Kentucky

2007 Distinguished Alumnus, Virginia Tech

2007 Honorary Member, Polish Society of Soil Science

2008 Distinguished Lecturer, USDA, Beltsville

2008 Distinguished Lecturer, University of Florida

2008 Fellow, Geochemical Society and European Association of Geochemists

2010 Geoffrey Smith Mentoring Award, Northeast Association of Graduate Schools

- 2010 Liebig Medal, International Union of Soil Sciences
- 2011 Einstein Professor, Chinese Academy of Sciences
- 2011 Honorary Professor, Institute for Urban Environment, Xiamen, China
- 2012 Honorary Member, International Union of Soil Sciences
- 2012 Honorary Professor, Huazhong Agricultural University, Wuhan, China

IV. Publications

A. Books Authored

1. Sparks, D.L. 1989. Kinetics of Soil Chemical Processes. Academic Press, New York.
2. Sparks, D.L. 1995. Environmental Soil Chemistry, Academic Press, San Diego, CA
3. Sparks, D.L. 2002. Environmental Soil Chemistry, 2nd Edition, Academic Press, San Diego, CA

B. Books Edited

1. Sparks, D.L. 1986. Editor. Soil Physical Chemistry. CRC Press, Inc., Boca Raton, Florida.
2. Sparks, D.L., and D.L. Suarez. Editors. 1991. Rates of Soil Chemical Processes. Soil Sci. Soc. Am. Spec. Publ. 27. Soil Sci. Soc. Am., Madison, WI
3. Sparks, D.L. 1991. Editor. Advances in Agronomy. Vol. 46, Academic Press, New York
4. Sparks, D.L. 1992. Editor. Advances in Agronomy. Vol. 47, Academic Press, New York
5. Sparks, D.L. 1992. Editor. Advances in Agronomy. Vol. 48, Academic Press, New York
6. Sparks, D.L. 1993. Editor. Advances in Agronomy. Vol. 49, Academic Press, San Diego, CA
7. Sparks, D.L. 1993. Editor. Advances in Agronomy. Vol. 50, Academic Press, San Diego, CA
8. Sparks, D.L. 1993. Editor. Advances in Agronomy. Vol. 51, Academic Press, San Diego, CA

9. Sparks, D.L. 1994. Editor. *Advances in Agronomy*. Vol. 52, Academic Press, San Diego, CA
10. Sparks, D.L. 1994. Editor. *Advances in Agronomy*. Vol. 53, Academic Press, San Diego, CA
11. Sparks, D.L. 1995. Editor. *Advances in Agronomy*. Vol. 54, Academic Press, San Diego, CA
12. Sparks, D.L. 1995. Editor. *Advances in Agronomy*. Vol. 55, Academic Press, San Diego, CA
13. Sparks, D.L. 1995. Editor. *The environmental chemistry of soils, "Geoderma" Special Volume*, Elsevier, Amsterdam, The Netherlands.
14. Sparks, D.L. 1996. Editor. *Methods of Soil Analysis: Chemical Methods and Processes*. Am. Soc. Agron., Madison, WI
15. Sparks, D.L. 1996. Editor. *Advances in Agronomy*. Vol. 56, Academic Press, San Diego, CA
16. Sparks, D.L. 1996. Editor. *Advances in Agronomy*. Vol. 57, Academic Press, San Diego, CA.
17. Sparks, D.L. 1997. Editor. *Advances in Agronomy*. Vol. 58, Academic Press, San Diego, CA
18. Sparks, D.L. 1997. Editor. *Advances in Agronomy*. Vol. 59, Academic Press, San Diego, CA
19. Sparks, D.L. 1997. Editor. *Advances in Agronomy*. Vol. 60, Academic Press, San Diego, CA
20. Sparks, D.L. 1997. Editor. *Advances in Agronomy*. Vol. 61, Academic Press, San Diego, CA
21. Sparks, D.L. 1998. Editor. *Advances in Agronomy*. Vol. 62, Academic Press, San Diego, CA
22. Sparks, D.L. 1998. Editor. *Advances in Agronomy*. Vol. 63, Academic Press, San Diego, CA
23. Sparks, D.L. 1998. Editor. *Advances in Agronomy*. Vol. 64, Academic Press, San Diego, CA
24. Sparks, D.L. 1999. Editor. *Soil Physical Chemistry*, 2nd edition, CRC Press, Boca Raton, FL
25. Sparks, D.L., and T.J. Grundl. Editors. 1999. *Mineral-Water Interfacial Reactions: Kinetics and Mechanisms*. ACS Symp. Ser. 715, Am. Chem. Soc.

Washington, DC

26. Sparks, D.L. 1999. Editor. *Advances in Agronomy*. Vol. 65, Academic Press, San Diego, CA
27. Sparks, D.L. 1999. Editor. *Advances in Agronomy*. Vol. 66, Academic Press, San Diego, CA
28. Sparks, D.L. 1999. Editor. *Advances in Agronomy*. Vol. 67, Academic Press, San Diego, CA
29. Sparks, D.L. 2000. Editor. *Advances in Agronomy*. Vol. 68, Academic Press, San Diego, CA
30. Sparks, D.L. 2000. Editor. *Advances in Agronomy*. Vol. 69, Academic Press, San Diego, CA
31. Sparks, D.L. 2000. Editor. *Advances in Agronomy*. Vol. 70, Academic Press, San Diego, CA
32. Sparks, D.L. 2000. Editor. *Advances in Agronomy*. Vol. 71, Academic Press, San Diego, CA
33. Sparks, D.L. 2001. Editor. *Advances in Agronomy*. Vol. 72, Academic Press, San Diego, CA
34. Sparks, D.L. 2001. Editor. *Advances in Agronomy*. Vol. 73, Academic Press, San Diego, CA
35. Sparks, D.L. 2001. Editor. *Advances in Agronomy*. Vol. 74, Academic Press, San Diego, CA
36. Selim, H.M., and D.L. Sparks. 2001. Physical and chemical processes of water and solute transport/retention in soil. SSSA Spec. Publ. No. 56, Soil Sci. Soc. Am., Madison, WI
37. Selim, H.M., and D.L. Sparks. 2001. Heavy metals release in soils. Lewis Publishers, Boca Raton, FL
38. Sparks, D.L. 2002. Editor. *Advances in Agronomy*. Vol. 75, Academic Press, San Diego, CA
39. Sparks, D.L. 2002. Editor. *Advances in Agronomy*. Vol. 76, Academic Press, San Diego, CA
40. Sparks, D.L. 2002. Editor. *Advances in Agronomy*. Vol. 77, Academic Press, San Diego, CA
41. Sparks, D.L. 2003. Editor. *Advances in Agronomy*. Vol. 78, Academic Press, San Diego, CA

42. Sparks, D.L. 2003. Editor. *Advances in Agronomy*. Vol. 79, Academic Press, San Diego, CA
43. Sparks, D.L. 2003. Editor. *Advances in Agronomy*. Vol. 80, Academic Press, San Diego, CA
44. Sparks, D.L. 2004. Editor. *Advances in Agronomy*. Vol. 81, Academic Press, San Diego, CA
45. Sparks, D.L. 2004. Editor. *Advances in Agronomy*. Vol. 82, Academic Press, San Diego, CA
46. Sparks, D.L. 2004. Editor. *Advances in Agronomy*. Vol. 83, Academic Press, San Diego, CA
47. Sparks, D.L. 2004. Editor. *Advances in Agronomy*. Vol. 84, Academic Press, San Diego, CA
48. Hillel, D., J.L. Hatfield, D.S. Powlson, C. Rosenzweig, K. M. Scow, M.J. Singer and D. L. Sparks. 2005. Editors. *Encyclopedia of Soils in the Environment*. Elsevier Ltd., Oxford, UK
49. Sparks, D.L. 2005. Editor. *Advances in Agronomy*. Vol. 85, Academic Press, San Diego, CA
50. Sparks, D.L. 2005. Editor. *Advances in Agronomy*. Vol. 86, Academic Press, San Diego, CA
51. Sparks, D.L. 2005. Editor. *Advances in Agronomy*. Vol. 87, Academic Press, San Diego, CA
52. Sparks, D.L. 2005. Editor. *Advances in Agronomy*. Vol. 88, Academic Press, San Diego, CA
53. Sparks, D.L. 2005. *Metals in the Environment*. Elements, Vol. 4, No. 4, Mineralogical Soc. of Am., Washington, D.C
54. Tabatabai, M. A., and D. L. Sparks. Editors. 2005. *Chemical Processes in Soils*. No. 8. Soil Science Society of America Book Series. Soil Science Society of America, Madison, WI
55. Sparks, D.L. 2006. Editor. *Advances in Agronomy*. Vol. 89, Academic Press, San Diego, CA
56. Sparks, D.L. 2006. Editor. *Advances in Agronomy*. Vol. 90, Academic Press, San Diego, CA
57. Sparks, D.L. 2006. Editor. *Advances in Agronomy*. Vol. 91, Academic Press, San Diego, CA

58. Sparks, D.L. 2006. Editor. *Advances in Agronomy*. Vol. 92, Academic Press, San Diego, CA
59. Sparks, D.L. 2006. Editor. *Advances in Agronomy*. Vol. 93, Academic Press, San Diego, CA
60. Sparks, D.L. 2007. Editor. *Advances in Agronomy*. Vol. 94, Academic Press, San Diego, CA
61. Sparks, D.L. 2007. Editor. *Advances in Agronomy*. Vol. 95, Academic Press, San Diego, CA
62. Sparks, D.L. 2007. Editor. *Advances in Agronomy*. Vol. 96, Academic Press, San Diego, CA
63. Sparks, D.L. 2008. Editor. *Advances in Agronomy*. Vol. 97, Academic Press, San Diego, CA
64. Sparks, D.L. 2008. Editor. *Advances in Agronomy*. Vol. 98, Academic Press, San Diego, CA
65. Sparks, D.L. 2008. Editor. *Advances in Agronomy*. Vol. 99, Academic Press, San Diego, CA
66. Sparks, D.L. 2008. Editor. *Advances in Agronomy*. Vol. 100, Academic Press San Diego, CA
67. Sparks, D.L. 2009. Editor. *Advances in Agronomy*. Vol. 101, Academic Press, San Diego, CA
68. Sparks, D.L. 2009. Editor. *Advances in Agronomy*. Vol. 102, Academic Press, San Diego, CA
69. Sparks, D.L. 2009. Editor. *Advances in Agronomy*. Vol. 103, Academic Press, San Diego, CA
70. Sparks, D.L. 2009. Editor. *Advances in Agronomy*. Vol. 104, Academic Press, San Diego, CA
71. Sparks, D.L. 2010. Editor. *Advances in Agronomy*. Vol. 105, Academic Press, San Diego, CA
72. Sparks, D.L. 2010. Editor. *Advances in Agronomy*. Vol. 106, Academic Press, San Diego, CA
73. Sparks, D. L. 2010. Editor. *Advances in Agronomy*. Vol. 107, Academic Press, San Diego, CA
74. Sparks, D. L. 2010. Editor. *Advances in Agronomy*. Vol. 108, Academic Press, San Diego, CA

75. Sparks, D. L. 2010. Editor. *Advances in Agronomy*. Vol. 109, Academic Press, San Diego, CA
76. Sparks, D. L. 2011. Editor. *Advances in Agronomy*. Vol. 110, Academic Press, San Diego, CA
77. Sparks, D. L. 2011. Editor. *Advances in Agronomy*. Vol. 111, Academic Press, San Diego, CA
78. Sparks, D. L. 2011. Editor. *Advances in Agronomy*. Vol. 112, Academic Press, San Diego, CA
79. Sparks, D. L. 2011. Editor. *Advances in Agronomy*. Vol. 113, Academic Press, San Diego, CA
80. Sparks, D. L. 2012. Editor. *Advances in Agronomy*. Vol. 114, Academic Press, San Diego, CA
81. Sparks, D. L. 2012. Editor. *Advances in Agronomy*, Vol. 115, Academic Press, San Diego, CA
82. Sparks, D. L. 2012. Editor, *Advances in Agronomy*, Vol. 116, Academic Press, San Diego, CA
83. Sparks, D. L. 2012. Editor, *Advances in Agronomy*, Vol. 117, Academic Press, San Diego, CA
84. Sparks, D. L. 2013. Editor, *Advances in Agronomy*, Vol. 118, Academic Press, San Diego, CA
85. Sparks, D. L. 2013. Editor, *Advances in Agronomy*, Vol. 119, Academic Press, San Diego, CA
86. Sparks, D. L. 2013. Editor, *Advances in Agronomy*, Vol. 120, Academic Press, San Diego, CA
87. Sparks, D. L. 2013. Editor, *Advances in Agronomy*, Vol. 121, Academic Press, San Diego, CA (In Press)
88. Xu, J. and D. L. Sparks, 2013. Editors, *Molecular Environmental Soil Science*. Springer, Dordrecht.
89. Sparks, D.L. 2013. Editor, *Advances in Agronomy*, Vol. 122, Academic Press, San Diego, CA
90. Sparks, D.L. 2014. Editor, *Advances in Agronomy*, Vol. 123, Academic Press, San Diego, CA
91. Sparks, D.L. 2014. Editor, *Advances in Agronomy*, Vol. 124, Academic Press, San Diego, CA

92. Sparks, D.L. 2014. Editor, *Advances in Agronomy*, Vol. 125, Academic Press, San Diego, CA
93. Sparks, D.L. 2014. Editor, *Advances in Agronomy*, Vol. 126, Academic Press, San Diego, CA (In Press)
94. Sparks, D.L. 2014. Editor, *Advances in Agronomy*, Vol. 127, Academic Press, San Diego, CA (In Press)

C. Chapters in Books

1. Sparks, D.L., and P.M. Huang. 1985. The physical chemistry of soil potassium. p. 201-276. *In* R.E. Munson (ed.) *Potassium in agriculture*. Soil Science Society of America, Madison, WI.
2. Sparks, D.L. 1985. Kinetics of ionic reactions in clay minerals and soils. p. 231-266. *In* N.C. Brady (ed.) *Advances in Agronomy*, Academic Press, New York.
3. Sparks, D.L. 1986. Kinetics of reactions in pure and mixed systems. p. 63-145. *In* D.L. Sparks (ed.) *Soil Physical Chemistry*, CRC Press, Boca Raton, FL
4. Sparks, D.L. 1986. Potassium release from sandy soils. p. 93-105. *In* H. von Peter (ed.) *Nutrient balances and the need for potassium*. International Potash Institute, Bern, Switzerland.
5. Sparks, D.L. 1987. Potassium dynamics in soil potassium. p. 1-63. *In* B.A. Stewart (ed.) *Advances in Soil Science*. Vol. 6, Springer-Verlag, New York.
6. Sparks, D.L. 1987. Kinetics of soil chemical processes: Past progress and future needs. p. 61-73. *In* L.L. Boersma (ed.). *Future developments in soil science*. Soil Sci. Soc. Am. Spec. Publ., Madison, Wisconsin.
7. Sparks, D.L. 1989. Kinetics of reactions on soil systems. p. 362-365. *McGraw-Hill Yearbook of Science and Engineering*. McGraw-Hill, New York.
8. Sparks, D.L. 1990. Kinetics of soil chemical processes: An overview. *Proc. of 14th International Soil Science Congress*, Kyoto, Japan. II4-II9.
9. Feigenbaum, S., A. Bar-Tal, and D.L. Sparks. 1990. Dynamics of soil potassium in multicationic systems. p. 145-161. *In* H. von Peter (ed.) *Development of K-fertilizer recommendations*. Proc. 22nd Colloquium Int. Potash Institute, Bern, Switzerland.
10. Schulthess, C.P., and D.L. Sparks. 1991. Equilibrium based modeling of chemical sorption on soils and soil constituents. *Adv. Soil Sci.* 16:121-163.
11. Sparks, D.L. 1991. p. 585-637. Chemical kinetics and mass transfer processes in soils and soil constituents. *In* J. Bear and Y. Corapcioglu (eds.)

Transport processes in porous media. NATO ASI Series E: Vol. 202, Kluwer Academic Publishers B.V., Dordrecht.

12. Sparks, D.L., and P. Zhang. 1991. p. 61-94. Relaxation methods for studying soil chemical processes. *In* D.L. Sparks and D.L. Suarez (eds.). Rates of soil chemical processes. Soil Sci. Soc. Am. Spec. Publ. 27, Soil Sci. Soc. Am., Madison, WI.
13. Aharoni, C., and D.L. Sparks. 1991. p. 1-18. Kinetics of soil chemical reactions - A theoretical treatment. *In* D.L. Sparks and D.L. Suarez (eds.). Rates of soil chemical processes. Soil Sci. Soc. Am., Madison, WI.
14. Sparks, D.L. 1991. Agronomy. p. 60. Academic Press Dictionary of Science and Technology. Harcourt Brace Jovanovich, Inc., San Diego, CA
15. Sparks, D.L. 1992. Soil kinetics. p. 219-229. *In* W.A. Niernberg. (ed) Encyclopedia of earth system science. Vol. 4. Academic Press, New York.
16. Sparks, D.L. 1993. Soil decontamination. p. 671-680. *In* Morton Corn (ed) Handbook of hazardous materials. Academic Press, New York.
17. Sparks, D.L. 1993. Kinetics of important soil chemical reactions. *In* J. Menon. (ed). Research trends in agronomy, Council of Scientific Research Integration, Sreekanthswaram, India.
18. Sparks, D.L. 1993. p. 1-9. Soil and environmental chemistry research in the Northeastern USA: Challenges and opportunities for the 1990's. *In* J.T. Sims and E. Hadley (eds), Am. Soc. Agron., Madison, WI.
19. Sparks, D.L., S.E. Fendorf, P.C. Zhang, and L. Tang. 1993. Kinetics and mechanisms of environmentally important reactions on soil colloidal surfaces. *In* D. Petruzzeli and F. Helfferich (eds) Migration and fate of pollutants in soils and subsoils. NATO ASI Series G, Vol. 32, Springer-Verlag, Berlin.
20. Sparks, D.L. 1994. Advising M.S. students: Issues and perspectives. pp. 53-59. *In* P. Baveye (ed). Soil science education, Soil Science Society of America, Madison, WI.
21. Sparks, D.L. 1994. Soil chemistry. p. 75-81. *In* C.J. Arntzen (ed.) Encyclopedia of agricultural science, Vol. 4, Academic Press, San Diego, CA.
22. Sparks, D.L. 1995. p. 35-58. Kinetics of metal sorption reactions. *In* H.E. Allen, C.P. Huang, G.W. Bailey, and A.R. Bowers (eds.). Metal speciation and contamination of soil. Lewis Publishers, Chelsea, Michigan.
23. Fendorf, S.E., and D.L. Sparks. 1996. XAFS spectroscopy. p. 377-416. *In* D.L. Sparks (ed). Methods of Soil Analysis: Part 3. Chemical Methods. Soil Sci. Soc. Am. Book Series 5, SSSA, Madison, WI.

24. Helmke, P.A., and D.L. Sparks. 1996. Lithium, sodium, potassium, cesium, and rubidium. p. 551-574. *In* D.L. Sparks (ed). Methods of soil analysis: Part 3. Chemical methods. Soil Sci. Soc. Am. Book Series 5, SSSA, Madison, WI.
25. Sparks, D.L., S.E. Fendorf, C.V. Toner, IV, and T.H. Carski. 1996. Kinetic methods and measurements. p. 1275-1307. *In* D.L. Sparks (ed). Methods of soil analysis: Part 3. Chemical methods. Soil Sci. Soc. Am. Book Series 5, SSSA, Madison, WI.
26. Sparks, D.L. 1998. Kinetics of sorption/release reactions on natural particles. p. 413-448. *In* P.M. Huang, N. Senesi and J. Buffle (eds). Structure and surface reactions of soil particles, Wiley, NY.
27. Sparks, D.L. 1998. Kinetics of soil chemical phenomena: Future directions. p. 81-101. *In* P.M. Huang, D.L. Sparks, and S.A. Boyd (eds.) Future prospects for soil chemistry. SSSA Spec. Publ. 55, Soil Sci. Soc. Am., Madison, WI.
28. Sparks, D.L. 1999. Kinetics and mechanisms of chemical reactions at the soil mineral/water interface. *In* D. L. Sparks (ed.). p. 135-192. Soil physical chemistry, 2nd edition. CRC Press, Boca Raton, FL.
29. Sparks, D.L. 1999. Kinetics and mechanisms of soil chemical reactions. p. B-123-167. *In* M.E. Sumner (ed) Handbook of soil science, CRC Press, Boca Raton, FL.
30. Sparks, D.L. 1999. Bioavailability of soil potassium. p. D38-D53. *In* M.E. Sumner (ed.) Handbook of soil science, CRC Press, Boca Raton, FL.
31. Sparks, D.L., A.M. Scheidegger, D.G. Strawn, and K.G. Scheckel. 1999. Kinetics and mechanisms of metal sorption at the mineral-water interface. p. 108-135. *In* D.L. Sparks and T.J. Grundl (eds.) Mineral-water interfacial reactions. ACS Symp. Series 715, Am. Chem. Soc., Washington, DC.
32. Strawn, D.G., and D.L. Sparks. 1999. Sorption kinetics of trace elements in soils and soil materials. p. 1-28. *In* H.M. Selim and I. Iskandar (eds.) Fate and transport of heavy metals in the vadose zone. Lewis Publishers, Chelsea, MI.
33. Peak, D., E.J. Elzinga, and D.L. Sparks. 2001. Understanding sulfate adsorption mechanisms on iron (III) oxides and hydroxides: Results from ATR-FTIR spectroscopy. p. 167-190. *In* H.M. Selim and D.L. Sparks (eds.) Heavy metals release in soils. Lewis Publishers, Boca Raton, FL.
34. Ford, R.G., A.C. Scheinost, and D.L. Sparks. 2001. Frontiers in metal sorption/precipitation mechanisms on soil mineral surfaces. *Adv. Agron.*74:41-62.
35. Roberts, D., A.C. Scheinost and D.L. Sparks. 2003. Zinc speciation in

contaminated soils combining direct and indirect characterization methods. P. 187-227. *In* Geochemical and Hydrological Reactivity of Heavy Metals in Soils, H. M. Selim and W. L. Kingery, eds. Lewis Publishers, Boca Raton.

36. Sparks, D.L. 2005. Sorption of metals, p. 532-537. *In* Encyclopedia of Soils in the Environment. D. Hillel, J.L. Hatfield, D.S. Powlson, C. Rosenzweig, K.M. Scow, J.J. Singer and D. L. Sparks, eds. Elsevier Ltd., Oxford, UK.
37. Sparks, D.L. 2005. Sorption-desorption kinetics, p. 556-561. *In* Encyclopedia of Soils in the Environment. D. Hillel, J.L. Hatfield, D.S. Powlson, C. Rosenzweig, K.M. Scow, M.J. Singer and D.L. Sparks, eds. Elsevier Ltd., Oxford, UK.
38. Matocha, C.J., K.G. Scheckel and D.L. Sparks. 2005. Kinetics and mechanisms of soil biogeochemical processes, p. 309-342. *In* Chemical Processes in Soils. M.A. Tabatabai and D.L. Sparks, eds. No. 8, Soil Science Society of America, Madison WI.
39. Roberts, D., M. Nachtegaal and D.L. Sparks. 2005. Speciation of metals in soils, p.619-654. *In* Chemical Processes in Soils. M.A. Tabatabai and D.L. Sparks, eds. No. 8, Soil Science Society of America, Madison WI.
40. Sparks, D.L. 2005. Metal and oxyanion sorption on naturally occurring oxide and clay mineral surfaces. *In* V.H. Grassian (ed.) Environmental Catalysis. Taylor and Francis, Boca Raton, FL.
41. Toor, G.S., S. Hunger, J.D. Peak, J.T. Sims and D.L. Sparks. 2006. Advances in the characterization of phosphorus in organic wastes: Environmental and agronomic applications, *In* Advances in Agronomy, 89:1-72.
42. Sparks, D.L. 2006. Historical aspects of soil chemistry. *In* Warkentin, B.P. Editor. 2006. Footprints *In* The Soil: People And Ideas In Soil History. Elsevier Ltd., Oxford, UK
43. Sparks, D.L. 2006. The future of soil science, p. 131-132. *In* Hartemink, A.E. Editor. 2006. The Future of Soil Science. IUSS, Wageningen, The Netherlands.
44. McNear, D.H., R. Tappero, and D.L.Sparks. 2006. Elemental analysis of roots and fungi, p. 204-205. *In* Handbook of Methods Used in Rhizosphere Research. J. Luster and R. Finlay, eds., Swiss Federal Research Institute, Birmensdorf, Switzerland.
45. Tappero, R., D.R. Roberts, M.A. Grafe and D.L. Sparks. 2006. Elements in soils: Total and extractable contents, solid phase speciation, p. 235-236. *In* Handbook of Methods Used in Rhizosphere Research. J. Luster and R. Finlay, eds., Swiss Federal Research Institute, Birmensdorf, Switzerland.
46. Brantley, S. L., T. S. White, A. F. White, D. L. Sparks, D. Richter, K.

- Pregitzer, L. Derry, J. Chorover, O. Chadwick, R. April, S. Anderson, R. Amundson, 2006. *Frontiers in Exploration of the Critical Zone: Report of a workshop sponsored by National Science Foundation (NSF)*, October 24-26, 2005, Newark, DE, 30p.
47. Grafe, M. and D. L. Sparks. 2006. Solid phase speciation of arsenic, p. 75-91, *In Managing Arsenic in the Environment From Soil to Human Health*, R. Naidu, eds., CSIRO Publishing, Collingwood, Victoria, Australia.
 48. Arai, Y. and D.L. Sparks. 2007. Phosphate reaction dynamics in soils and soil minerals: A multiscale approach, *In Advances in Agronomy*, 94:135-179.
 49. Borda, M.J. and D.L. Sparks. 2008. Kinetics and mechanisms of sorption-desorption in soils: A multiscale assessment, p.75-124. *In Biophysico-Chemical Processes of Heavy Metals and Metalloids in Soil Environments*. A. Violante, P. M. Huang, and G.M. Gadd, eds., John Wiley & Sons, Inc., New York.
 50. Ginder-Vogel, M. and D. L. Sparks. 2010. The impacts of X-ray absorption spectroscopy on understanding soil processes and reaction mechanisms, p. 1-26. *In Developments in Soil Science 34: Synchrotron-based Techniques in Soils and Sediments*. B. Singh and M. Grafe, eds. Elsevier, Burlington, MA.
 51. Sparks, D.L. and M. Ginder-Vogel. 2011. The Role of Synchrotron Radiation in Elucidating the Biogeochemistry of Metal(oids) and Nutrients at Critical Zone Interfaces, p.1-1 - 1-21. *In Handbook of Soil Sciences: Resource Management and Environmental Impacts*, Second Edition. P.M. Huang, Y. Li, M. E. Sumner, eds. CRC Press, Boca Raton, FL.
 52. Sparks, D.L. 2011. Kinetics and Mechanisms of Soil Chemical Reactions, p.13-1 - 13-30. *In Handbook of Soil Sciences: Properties and Processes*, Second Edition. P.M. Huang, Y. Li, M. E. Sumner, eds. CRC Press, Boca Raton, FL.
 53. Sparks, D.L. 2011. Bioavailability of Soil Potassium, p.11-37 - 11-47. *In Handbook of Soil Sciences: Resource Management and Environmental Impacts*, Second Edition. P.M. Huang, Y. Li, M. E. Sumner, eds. CRC Press, Boca Raton, FL.
 54. Sparks, D.L. 2013. Advances in the Use of Synchrotron Radiation to Elucidate Environmental Interfacial Reaction Processes and Mechanisms in the Earth's Critical Zone. *In Molecular Environmental Soil Science*. J. Xu and D.L. Sparks, eds. Pp. 93-114. *Progress in Soil Science*. Dordrecht: Springer.

D. Refereed Publications

1. Sparks, D.L., R.L. Blevins, H.H. Bailey, and R.I. Barnhisel. 1979. Relationship of ammonium nitrogen distribution to mineralogy in a Hapludalf soil. *Soil Sci. Soc. Am. J.* 43:786-789.
2. Sparks, D.L. 1980. Chemistry of soil potassium in Atlantic Coastal Plain soils: A review. *Commun. in Soil Sci. and Plant Anal.* 11:435-449.
3. Sparks, D.L., D.C. Martens, and L.W. Zelazny. 1980. Plant uptake and leaching of applied and indigenous potassium in Dothan soils. *Agron. J.* 72:552-555.
4. Sparks, D.L., L.W. Zelazny, and D.C. Martens. 1980a. Kinetics of potassium exchange in a Paleudult from the Coastal Plain of Virginia. *Soil Sci. Soc. Am. J.* 44:37-40.
5. Sparks, D.L., L.W. Zelazny, and D.C. Martens. 1980b. Kinetics of potassium desorption in soils using miscible displacement. *Soil Sci. Soc. Am. J.* 44:1205-1208.
6. Sparks, D.L. 1981. On the chemistry of potassium in sandy soil. *Potash Review* 5:1-11.
7. Sparks, D.L., and W.C. Liebhardt. 1981. Effects of long term lime and potassium applications on quantity-intensity (Q/I) relationships in sandy soil. *Soil Sci. Soc. Am. J.* 47:786-790.
8. Elliott, H.A., and D.L. Sparks. 1981. Electrokinetic behavior of a Paleudult profile in relation to mineralogical composition. *Soil Sci.* 132:402-409.
9. Sparks, D.L., and P.M. Jardine. 1981. Thermodynamics of potassium exchange in soil using a kinetics approach. *Soil Sci. Soc. Am. J.* 45:1094-1099.
10. Sparks, D.L., and W.C. Liebhardt. 1982. Temperature effects on potassium exchange and selectivity in Delaware soils. *Soil Sci.* 133:10-17.
11. Pill, W.G., and D.L. Sparks. 1982. Effects of nitrapyrin and nitrogen form on tomato growth, water relations, and ion composition. *J. Am. Soc. Hort. Sci.* 107:487-492.
12. Sparks, D.L., and J.E. Rechcigl. 1982. Comparison of batch and miscible displacement techniques to describe potassium adsorption kinetics in Delaware soils. *Soil Sci. Soc. Am. J.* 46:875-877.
13. Mitchell, W.H., and D.L. Sparks. 1982. Influence of subsurface irrigation and organic additions on top and root growth of field corn. *Agron. J.* 74:1084-1088.

14. Martin, H.W., and D.L. Sparks. 1983. Kinetics of nonexchangeable potassium release from two Coastal Plain soils. *Soil Sci. Soc. Am. J.* 47:883-887.
15. Evans, C.M., and D.L. Sparks. 1983. On the chemistry and mineralogy of boron in pure and in mixed systems: A review. *Commun. Soil Sci. Plant Anal.* 14:827-846.
16. Sparks, D.L., and P.M. Jardine. 1984. Comparison of kinetic equations to describe K-Ca exchange in pure and in mixed systems. *Soil Sci.* 138:115-122.
17. Sparks, D.L. 1984. Ion activities: An historical and theoretical overview. *Soil Sci. Soc. Am. J.* 48:514-518.
18. Jardine, P.M., and D.L. Sparks. 1984a. Potassium-calcium exchange in a multireactive soil system: I. Kinetics. *Soil Sci. Soc. Am. J.* 48:39-45.
19. Jardine, P.M., and D.L. Sparks. 1984b. Potassium-calcium exchange in a multireactive soil system: II. Thermodynamics. *Soil Sci. Soc. Am. J.* 48:45-50.
20. Martin, H.W., and D.L. Sparks. 1984. On the behavior of nonexchangeable potassium in soils. *Commun. Soil Sci. Plant Anal.* 16:133-163.
21. Sparks, D.L., and T.H. Carski. 1985. Kinetics of potassium exchange in heterogeneous systems. *Applied Clay Science.* 1:89-101.
22. Rechcigl, J.E., and D.L. Sparks. 1985. Acid rain effects on soils: A review. *Commun. Soil Sci. Plant Anal.* 16:653-680.
23. Carski, T.H., and D.L. Sparks. 1985. A modified miscible displacement technique for investigating adsorption-desorption phenomena in soils. *Soil Sci. Soc. Am. J.* 49:1114-1116.
24. Alvarez, R., and D.L. Sparks. 1985. Polymerization of silicate anions in solutions at low concentrations. *Nature* 318 (6047): 649-651.
25. Ogwada, R.A., and D.L. Sparks. 1986a. Use of mole and equivalent fractions in describing thermodynamics of potassium exchange in soils. *Soil Sci.* 141:268-273.
26. Ogwada, R.A., and D.L. Sparks. 1986b. A critical evaluation on the use of kinetics for determining thermodynamics of ion exchange in soils. *Soil Sci. Soc. Am. J.* 50:300-305.
27. Ogwada, R.A., and D.L. Sparks. 1986c. Kinetics of ion exchange on clay minerals and soil. I. Evaluation of methods. *Soil Sci. Soc. Am. J.* 50:1158-1162.

28. Ogwada, R.A., and D.L. Sparks. 1986d. Kinetics of ion exchange on clay minerals and soil. II. Elucidation of rate-limiting steps. *Soil Sci. Soc. Am. J.* 50:1162-1164.
29. Schulthess, C.P., and D.L. Sparks. 1986. Backtitration technique for proton isotherm modeling of oxide surfaces. *Soil Sci. Soc. Am. J.* 50:1406-1411.
30. Carski, T.H., and D.L. Sparks. 1987. Differentiation of soil N fractions using a kinetic approach. *Soil Sci. Soc. Am. J.* 51:314-317.
31. Schulthess, C.P., and D.L. Sparks. 1987. Two site model for Al-oxide with mass balanced competitive pH + salt/salt dependent reactions. *Soil Sci. Soc. Am. J.* 51:1136-1144.
32. Sadusky, M.C., D.L. Sparks, M.R. Noll, and G.J. Hendricks. 1987. Kinetics and mechanisms of potassium release from sandy Middle Atlantic Coastal Plain soils. *Soil Sci. Soc. Am. J.* 51:1460-1465.
33. Sandler, H.A., R.B. Carroll, and D.L. Sparks. 1988. Effect of biocidal treatments on cation exchange capacity and fusarium blight of soybean in Delaware soils. *Agron. J.* 80:8-12.
34. Rechcigl, J.E., M.R. Teel, and D.L. Sparks. 1988. Ammonium fixation from urea as influenced by nitrapyrin. *Commun. Soil Sci. Plant Anal.* 19:1583-1591.
35. Schulthess, C.P., and D.L. Sparks. 1988. A critical assessment of surface adsorption models. *Soil Sci. Soc. Am. J.* 52:92-97.
36. Schulthess, C.P., and D.L. Sparks. 1989. Competitive ion adsorption on oxides. *Soil Sci. Soc. Am. J.* 53:316-323.
37. Seyfried, M.S., D.L. Sparks, A. Bar-Tal, and S. Feigenbaum. 1989. Kinetics of Ca-Mg exchange on soil using a stirred-flow reaction chamber. *Soil Sci. Soc. Am. J.* 53:406-410.
38. Parker, D.R., D.L. Sparks, G.J. Hendricks, and M.C. Sadusky. 1989. Potassium in Atlantic Coastal Plain soils. I. Soil characterization and distribution of potassium. *Soil Sci. Soc. Am. J.* 53:392-396.
39. Parker, D.R., G.J. Hendricks, and D.L. Sparks. 1989. Potassium in Atlantic Coastal Plain soils: II. Crop responses and changes in soil K under intensive management. *Soil Sci. Soc. Am. J.* 53:397-401.
40. Toner, C.V., IV, D.L. Sparks, and T. H. Carski. 1989. Anion exchange chemistry of Middle Atlantic soils: Charge properties and nitrate retention kinetics. *Soil Sci. Soc. Am. J.* 53:1061-1067.
41. Zhang, P., and D.L. Sparks. 1989. Kinetics and mechanisms of molybdate adsorption at the goethite/water interface using pressure-jump relaxation. *Soil Sci. Soc. Am. J.* 53:1028-1034.

42. Grant, S.A., and D.L. Sparks. 1989. Evaluation of activity coefficient models for exchangeable cations. *J. Phys. Chem.* 93:6265-6267.
43. Zhang, Z.Z., D.L. Sparks, and R.A. Pease. 1990. Sorption and desorption of acetonitrile and montmorillonite from aqueous solutions.. *Soil Sci. Soc. Am. J.* 54:351-356.
44. Bar-Tal, A., D.L. Sparks, J. Pesek, and S. Feigenbaum. 1990. Kinetics of ion exchange on soil constituents using a stirred-flow chamber. I. Theoretical considerations. *Soil Sci. Soc. Am. J.* 54:1272-1277.
45. Eick, M.J., A. Bar-Tal, D.L. Sparks, and S. Feigenbaum. 1990. Analyses of adsorption kinetics using a stirred-flow chamber: II. Potassium-calcium exchange on clay minerals. *Soil Sci. Soc. Am. J.* 54:1278-1282.
46. Zhang, P.C., and D.L. Sparks. 1990. Kinetics and mechanisms of sulfate adsorption/desorption on goethite using pressure-jump relaxation. *Soil Sci. Soc. Am. J.* 54:1266-1273.
47. Zhang, Z.Z., D.L. Sparks, and N. Scrivner. 1990. Sorption of acetonitrile and acrylonitrile on montmorillonite from binary and ternary aqueous solutions. *Soil Sci. Soc. Am. J.* 54:1564-1571.
48. Zhang, P.C., and D.L. Sparks. 1990. Kinetics of selenate and selenite adsorption/desorption at the goethite/water interface. *Environ. Sci. Technol.* 24:1848-1856.
49. Feigenbaum, S., A. Bar-Tal, R. Portnoy, and D.L. Sparks. 1991. Binary and ternary exchange of potassium on calcareous montmorillonitic soils. *Soil Sci. Soc. Am. J.* 55:49-56.
50. Sadusky, M.C., and D.L. Sparks. 1991. Anionic effects on potassium reactions in variable charge Atlantic Coastal Plain soils. *Soil Science Soc. Am. J.* 55:371-375.
51. Bar-Tal, A., S. Feigenbaum, and D.L. Sparks. 1991. Potassium-salinity interactions in irrigated corn. *Irrig. Sci.* 12:27-35.
52. Aharoni, C., D.L. Sparks, S. Levinson, and I. Ravina. 1991. Kinetics of soil chemical reactions: Relationship between empirical equations and diffusion models. *Soil Sci. Soc. Am. J.* 55:1307-1312.
53. Grant, S.A., and D.L. Sparks. 1991. Ca-K-H exchange on silt-, clay-, and silt + clay-sized soil separates. *J. Chem. Soc. Faraday Trans.* 87:2501-2506.
54. Fendorf, S.E., M. Fendorf, D.L. Sparks, and R. Gronsby. 1991. Use of TEM for characterization of reactions of MnO₂ with Cr(III) and Al(III). *Proc. 49th Annual Meeting of Electron Microscopy Society of America.* p. 634-635.

55. Zhang, Z.Z., and D.L. Sparks. 1992. Retention of acetonitrile and acrylonitrile on clays. *Proc. of the Underground injection practices council.* p. 145-156.
56. Zhang, Z.Z., D.L. Sparks, and N.C. Scrivner. 1992. The effect of clay dispersion on the sorption of acetonitrile. *Clays Clay Miner.* 40:355-358.
57. Fendorf, S.E., M. Fendorf, D.L. Sparks, and R. Gronsby. 1992. Inhibitory mechanisms of Cr(III) oxidation by δ -MnO₂. *J. Colloid Interf. Sci.* 153:37-54.
58. Fendorf, S.E., D.L. Sparks, M. Fendorf, and R. Gronsby. 1992. Surface precipitation reactions on oxide surfaces. *J. Colloid Interf. Sci.* 148:295-298.
59. Tang, L., and D.L. Sparks. 1993. Cation-exchange kinetics on montmorillonite using pressure-jump relaxation. *Soil Sci. Soc. Am. J.* 57:42-46.
60. Fendorf, S.E., D.L. Sparks, J.A. Franz, and D.M. Camaioni. 1993. Electron paramagnetic resonance stopped-flow kinetic study of manganese (II) sorption-desorption on birnessite. *Soil Sci. Soc. Am. J.* 57:57-62.
61. Zhang, P.C., and D.L. Sparks. 1993. Kinetics of phenol and aniline adsorption and desorption on an organo-clay. *Soil Sci. Soc. Am. J.* 57:340-345.
62. Zhang, Z.Z., D.L. Sparks, and N.C. Scrivner. 1993. Sorption and desorption of quaternary amine cations on clays. *Environ. Sci. Technol.* 27:1625-1631.
63. Zhang, Z.Z., D.L. Sparks, and N.C. Scrivner. 1994. Characterization and modeling of the Al-oxide/aqueous solution interface. I. Measurement of electrostatic potential at the origin of the diffuse layer using negative adsorption of Na ions. *J. Colloid Interf. Sci.* 162:244-251.
64. Salinger, Y., D.L. Sparks, M. Ghodrati, and G.J. Hendricks. 1994. Kinetics of ion removal from an iron-rich industrial coproduct. I. Chloride. *J. Environ. Qual.* 23:1194-1200.
65. Salinger, Y., D.L. Sparks, and J.D. Pesek. 1994. Kinetics of ion removal from an iron-rich industrial coproduct. II. Sulfate. *J. Environ. Qual.* 23:1201-1205.
66. Salinger, Y., D.L. Sparks, and J.D. Pesek. 1994. Kinetics of ion removal from an industrial coproduct. III. Manganese and chromium. *J. Environ. Qual.* 23:1205-1211.
67. Keren, R., P.R. Grossl, and D.L. Sparks. 1994. Equilibrium and kinetics of borate adsorption-desorption on pyrophyllite in aqueous suspensions. *Soil Sci. Soc. Am. J.* 58:1116-1122.

68. Fendorf, S.E., G.M. Lamble, M.G. Stapleton, M.J. Kelley, and D.L. Sparks. 1994. Mechanisms of chromium(III) sorption on silica: I. Cr(III) surface structure derived by extended x-ray absorption fine structure (EXAFS) spectroscopy. *Environ. Sci. Technol.* 28:284-289.
69. Fendorf, S.E., and D.L. Sparks. 1994. Mechanisms of chromium(III) sorption on silica: II. Effects of reaction conditions. *Environ. Sci. Technol.* 28:290-297.
70. Grossl, P.R., D.L. Sparks, and C.C. Ainsworth. 1994. Rapid kinetics of Cu (II) adsorption/desorption on goethite. *Environ. Sci. Technol.* 28:1422-1429.
71. Fendorf, S.E., D.L. Sparks, G.M. Lamble, and M.J. Kelley. 1994. Applications of x-ray absorption fine structure spectroscopy to soils. *Soil Sci. Soc. Am. J.* 58:1583-1595.
72. Stapleton, M.G., D.L. Sparks, and S.K. Dentel. 1994. Sorption of pentachlorophenol to HDTMA-Clay as a function of ionic strength and pH. *Environ. Sci. Technol.* 28:2330-2335.
73. Fendorf, S.E., D.L. Sparks, and M. Fendorf. 1994. Mechanism of aluminum sorption on birnessite: Influences on chromium oxidation. *Trans. of Int. Soc. Soil Sci., Vol. 3a, Commission II:* 129-145.
74. Fendorf, S.E., and D.L. Sparks. 1994. Application of surface spectroscopies and microscopies to elucidate sorption mechanisms on oxide surfaces. *Trans. of Int. Soc. Soil Sci., Vol. 3a, Commission II:* 182-199.
75. Bar-Tal, A., M.J. Eick, S. Feigenbaum, D.L. Sparks, and S. Fishman. 1995. Determination of rate coefficients for potassium-calcium exchange on vermiculite using a stirred-flow chamber. *Soil Sci. Soc. Am. J.* 59:760-765.
76. Grossl, P.R., and D.L. Sparks. 1995. Evaluation of contaminant ion adsorption/desorption on goethite using pressure-jump relaxation kinetics. *Geoderma* 67:87-101.
77. Keren, R., and D.L. Sparks. 1995. The role of edge surfaces in flocculation of 2:1 clay minerals. *Soil Sci. Soc. Am. J.* 59:430-435.
78. Toner, C.V., IV, and D.L. Sparks. 1995. Chemical relaxation and double layer model analysis of boron adsorption on alumina. *Soil Sci. Soc. Am. J.* 59:395-404.
79. Eick, M.J., P.R. Grossl, D.C. Golden, D.L. Sparks, and D.W. Ming. 1996. Dissolution kinetics of a lunar glass simulant at 25°C: The effect of pH and organic acids. *Geochimica et Cosmochimica Acta* 60:157-170.
80. Eick, M.J., P.R. Grossl, D.C. Golden, D.L. Sparks, and D.W. Ming. 1996. Dissolution of a lunar basalt simulant as affected by pH and organic anions.

Geoderma 74:139-160.

81. Scheidegger, A.M., G.M. Lamble, and D.L. Sparks. 1996. Investigation of Ni sorption on pyrophyllite: An XAFS study. *Environ. Sci. Technol.* 30:548-554.
82. Scheidegger, A.M., and D.L. Sparks. 1996. Kinetics of the formation and the dissolution of nickel surface precipitates on pyrophyllite. *Chem. Geol.* 132:157-164.
83. Lee, S.Z., H.E. Allen, C.P. Huang, D.L. Sparks, P.F. Sanders, and W.J.G.M. Peijnenburg. 1996. Predicting soil-water partition coefficients for cadmium. *Environ. Sci. Technol.* 12:3418-3424.
84. Scheidegger, A.M., and D.L. Sparks. 1996. A critical assessment of sorption-desorption mechanisms at the soil mineral/water interface. *Soil Sci.* 161:813-831.
85. Scheidegger, A.M., M. Fendorf, and D.L. Sparks. 1996. Mechanisms of nickel sorption on pyrophyllite: Macroscopic and microscopic approaches. *Soil Sci. Soc. Am. J.* 60:1763-1772.
86. Zhang, Z.Z., and D.L. Sparks. 1996. Sodium-copper exchange on Wyoming montmorillonite in chloride, perchlorate, nitrate, and sulfate solutions. *Soil Sci. Soc. Am. J.* 60:1750-1757.
87. Scheidegger, A.M., G.M. Lamble, and D.L. Sparks. 1997. The kinetics of nickel sorption on pyrophyllite as monitored by X-ray absorption fine structure (XAFS) spectroscopy. *J. de Physique* 4(7):C2-773-775.
88. Zhou, M., R.K. Trubey, Z.O. Keil, and D.L. Sparks. 1997. Study of the effects of environmental variables and supercritical fluid extraction parameters on the extractability of pesticide residues from soils using a multivariate optimization scheme. *Environ. Sci. Technol.* 31:1934-1939.
89. Steffens, D., and D.L. Sparks. 1997. Kinetics of nonexchangeable ammonium release from soils. *Soil Sci. Soc. Am. J.* 61:455-462.
90. Fendorf, S.E., M.J. Eick, P.R. Grossl, and D.L. Sparks. 1997. Arsenate and chromate retention mechanisms on goethite. 1. Surface structure. *Environ. Sci. Technol.* 31:315-320.
91. Grossl, P.R., M.J. Eick, D.L. Sparks, S. Goldberg, and C.C. Ainsworth. 1997. Arsenate and chromate retention mechanisms on goethite. 2. Kinetic evaluation using a pressure-jump relaxation technique. *Environ. Sci. Technol.* 31:321-326.
92. DiVincenzo, J.P., and D.L. Sparks. 1997. Slow sorption kinetics of pentachlorophenol on soil: Concentration effects. *Environ. Sci. Technol.* 31:977-983.

93. Jin, Y., H.E. Allen, C.P. Huang, D.L. Sparks, and P.F. Sanders. 1997. Kinetics of mercury adsorption and desorption on soil. *Environ. Sci. Technol.* 31:496-503.
94. Scheidegger, A.M., G.M. Lamble, and D.L. Sparks. 1997. Spectroscopic evidence for the formation of mixed-cation, hydroxide phases upon metal sorption on clays and aluminum oxides. *J. Colloid Interf. Sci.* 186:118-128.
95. Strawn, D.G., A.M. Scheidegger, and D.L. Sparks. 1998. Kinetics and mechanisms of Pb(II) sorption and desorption at the aluminum oxide-water interface. *Environ. Sci. Technol.* 32:2596-2601.
96. Scheidegger, A.M., D.G. Strawn, G.M. Lamble, and D.L. Sparks. 1998. The kinetics of mixed Ni-Al hydroxide formation on clay and aluminum oxide minerals: A time-resolved XAFS study. *Geochimica Cosmochimica Acta.* 62:2233-2245.
97. Elzinga, E.J., and D.L. Sparks. 1999. Nickel sorption mechanisms in a pyrophyllite-montmorillonite mixture. *J. Colloid Interf. Sci.* 213:506-512.
98. Strawn, D.G., and D.L. Sparks. 1999. The use of XAFS to distinguish between inner- and outer-sphere lead adsorption complexes on montmorillonite. *J. Colloid Interf. Sci.* 216:257-269.
99. Peak, D., R.G. Ford, and D.L. Sparks. 1999. An in-situ ATR-FTIR investigation of sulfate bonding mechanisms on goethite. *J. Colloid Interf. Sci.* 218:289-299.
100. Ford, R.G., A.C. Scheinost, K.G. Scheckel, and D.L. Sparks. 1999. The link between clay mineral weathering and the stabilization of Ni surface precipitates. *Environ. Sci. Technol.* 33:3140-3144.
101. Roberts, D.R., A.M. Scheidegger, and D.L. Sparks. 1999. Kinetics of mixed Ni-Al precipitate formation on a soil clay fraction. *Environ. Sci. Technol.* 33:3749-3754.
102. Meeussen, J.C.L., J. Kleikemper, A.M. Scheidegger, M. Borkovec, E. Paterson, W.H. Van Riemsdijk, and D.L. Sparks. 1999. Multi-component transport of sulfate in a goethite-silica sand system at variable pH and ionic strength. *Environ. Sci. Technol.* 33:3443-3450.
103. Scheinost, A.C., R.G. Ford, and D.L. Sparks. 1999. The role of Al in the formation of secondary Ni precipitates on pyrophyllite, gibbsite, talc, and amorphous silica: A DRS Study. *Geochim. Cosmochim. Acta* 63:3193-3203.
104. Steffens, D., and D.L. Sparks. 1999. Effect of residence time on the kinetics of nonexchangeable ammonium release from illite and vermiculite. *J. Plant Nutr. Soil Sci.* 162:599-605.

105. Strawn, D.G. and D.L. Sparks. 2000. Effects of soil organic matter on the kinetics and mechanisms of Pb(II) sorption and desorption in the soil. *Soil Sci. Soc. Am. J.* 64:144-156.
106. Scheckel, K.G., and D.L. Sparks. 2000. Kinetics of the formation and dissolution of Ni precipitates in a gibbsite/amorphous silica mixture. *J. Colloid Interf. Sci.* 229:222-239.
107. Ford, R.G., and D.L. Sparks. 2000. The nature of Zn precipitates formed in the presence of pyrophyllite. *Environ. Sci. Technol.* 34:2479-2483.
108. Scheinost, A.C., and D.L. Sparks. 2000. Formation of layered single- and double-metal hydroxide precipitates at the mineral/water interface: A multiple-scattering XAFS analysis. *J. Colloid Interf. Sci.* 223:167-178.
109. Sparks, D.L. 2000. New frontiers in elucidating the kinetics and mechanisms of metal and oxyanion sorption at the soil mineral/water interface. *J. Plant Nutr. Soil Sci.* 163:563-570.
110. Arai, Y., E.J. Elzinga, and D.L. Sparks. 2001. X-ray absorption spectroscopic investigation of arsenite and arsenate adsorption at the aluminum oxide-water interface. *J. Colloid Interf. Sci.* 235:80-88.
111. Arai, Y., and D.L. Sparks. 2001. ATR-FTIR spectroscopic investigation on phosphate adsorption mechanisms at the ferrihydrite-water interface. *J. Colloid Interf. Sci.* 241:317-326.
112. DiVincenzo, J.P., and D.L. Sparks. 2001. Sorption of the neutral and charged forms of pentachlorophenol on soil: Evidence for different mechanisms. *Arch. Environ. Contam. Toxicol.* 40:445-450.
113. Elzinga, E.J., and D.L. Sparks. 2001. Reaction condition effects on nickel sorption mechanisms in illite-water suspensions. *Soil Sci. Soc. Am. J.* 65:94-101.
114. Elzinga, E.J., D. Peak, and D.L. Sparks. 2001. Spectroscopic studies of Pb(II)-sulfate interactions at the goethite-water interface. *Geochim. Cosmochim. Acta* 65:2219-2230.
115. Matocha, C.J., D.L. Sparks, J.E. Amonette, and R.K. Kukkadapu. 2001. Kinetics and mechanisms of birnessite reduction by catechol. *Soil Sci. Soc. Am. J.* 65:58-66.
116. Matocha, C.J., E.J. Elzinga, and D.L. Sparks. 2001. Reactivity of Pb(II) at the Mn(III,IV) (oxyhydr)oxide-water interface. *Environ. Sci. Tech.* 37:2967-2972.
117. O'Reilly, S.E., D.G. Strawn, and D.L. Sparks. 2001. Residence time effects on arsenate adsorption/desorption mechanisms on goethite. *Soil Sci. Soc. Am. J.* 65:67-77.

118. Scheckel, K.G., and D.L. Sparks. 2001. Temperature effects on nickel sorption kinetics at the mineral-water interface. *Soil Sci. Soc. Am. J.* 65:685-694.
119. Scheckel, K.G., and D.L. Sparks. 2001. Dissolution kinetics of nickel surface precipitates on clay mineral and oxide surfaces. *Soil Sci. Soc. Am. J.* 65:719-728.
120. Scheinost, A.C., S. Abend, K.I. Pandya, and D.L. Sparks. 2001. Kinetic controls on Cu and Pb sorption by ferrihydrite. *Environ. Sci. Tech.* 35:1090-1096.
121. Scheinost, A.C., H. Stanjek, D.G. Schulze, U. Gasser, and D.L. Sparks. 2001. Structural environment and oxidation state of Mn in goethite-groutite solid-solutions. *Amer. Min.* 86:139-146.
122. Sparks, D.L. 2001. Elucidating the fundamental chemistry of soils: Past and recent achievements and future frontiers. *Geoderma* 100:303-319.
123. Yamaguchi, N.U., A.C. Scheinost, and D.L. Sparks. 2001. Surface-induced nickel hydroxide precipitation in the presence of citrate and salicylate. *Soil Sci. Soc. Am. J.* 65:729-736.
124. Roberts, D.R., A.C. Scheinost, and D.L. Sparks. 2002. Zinc speciation in a smelter-contaminated soil profile using bulk and microspectroscopic techniques. *Environ. Sci. Technol.* 36:1742-1750.
125. Peak, D., and D.L. Sparks. 2002. Mechanisms of selenate adsorption on iron oxides and hydroxides. *Environ. Sci. Technol.* 36:1460-1465.
126. Arai, Y., and D.L. Sparks. 2002. Residence time effects on arsenate surface speciation at the aluminum oxide-water interface. *Soil Sci.* 167:303-314.
127. Elzinga, E. J., and D. L. Sparks. 2002. X-ray absorption spectroscopy study of the effects of pH and ionic strength on Pb(II) sorption to amorphous silica. *Environ. Sci. Technol.* 36: 4352-4357.
128. Peak, D., J.T. Sims and D.L. Sparks. 2002. Solid-state speciation of natural and alum-amended poultry litter using XANES spectroscopy. *Environ. Sci. Technol.* 36: 4253-4261.
129. Yamaguchi, N. U., A. C. Scheinost and D.L. Sparks. 2002. Influence of gibbsite surface area and citrate on Ni sorption mechanisms at pH 7.5. *Clays Clay Miner.* 50:784-790.
130. Peak, D., G. W. Luther, III, and D. L. Sparks. 2003. ATR-FTIR spectroscopic studies of boric acid adsorption on hydrous ferric oxide. *Geochimica et Cosmochimica Acta.* 67: 2551-2560.
131. Arai, Y., A. Lanzirotti, S. Sutton, J. A. Davis, and D. L. Sparks. 2003.

- Arsenic speciation and reactivity in poultry litter. *Environ. Sci. Technol.* 37: 4083-4090.
132. Dyer, J. A., P. Trivedi, N. C. Scrivner and D. L. Sparks. 2003. Lead sorption onto ferrihydrite. 2. Surface complexation modeling. *Environ. Sci. Technol.* 37: 915-922.
 133. Dyer, J. A., P. Trivedi, S. J. Sanders, N. C. Scrivner and D. L. Sparks. 2003. Lead sorption onto ferrihydrite. 3. Multistage contacting. *Environ. Sci. Technol.* 37: 923-930.
 134. Nachtegaal, M. and D. L. Sparks. 2003. Nickel sequestration in a kaolinite-humic acid complex. *Environ. Sci. Technol.* 37: 529-534.
 135. Roberts, D. R., R. G. Ford and D. L. Sparks. 2003. Kinetics and mechanisms of Zn complexation on metal oxides using EXAFS spectroscopy. *J. Colloid Interf. Sci.* 263: 364-376.
 136. Trivedi, P., J. A. Dyer, and D. L. Sparks. 2003. Lead sorption onto ferrihydrite. 1. A macroscopic and spectroscopic assessment. *Environ. Sci. Technol.* 37: 908-914.
 137. You, Y., G. F. Vance, D. L. Sparks, J. Zhuang, and Y. Jin. 2003. Sorption of MS2 bacteriophage to layered double hydroxides: Effects of reaction time, pH, and competing anions. *J. Environ. Qual.* 32: 2046-2053.
 138. Trivedi, P., J. A. Dyer, N. C. Scrivner and D. L. Sparks. 2004. Mechanistic and thermodynamic Interpretations of zinc sorption onto ferrihydrite. *J. Colloid Interf. Sci.* 270: 77-85.
 139. Dyer, J. A., P. Trivedi, N. C. Scrivner and D. L. Sparks. 2004. Surface complexation modeling of zinc sorption onto ferrihydrite. *J. Colloid Interf. Sci.* 270: 56-65.
 140. Dyer, J. A., P. Trivedi, S. J. Sanders, N. C. Scrivner, and D. L. Sparks. 2004. Treatment of zinc-contaminated water using a multistage ferrihydrite sorption system. *J. Colloid. Interf. Sci.* 270: 66-76.
 141. Arai, Y., D. L. Sparks, and J. A. Davis. 2004. Effects of dissolved carbonate on arsenate adsorption and surface speciation at the hematite-water interface. *Environ. Sci. Technol.* 38:817-824.
 142. Grafe, M., M. Nachtegaal, and D.L. Sparks. 2004. Formation of metal-arsenate precipitates at the goethite-water interface. *Environ. Sci. Technol.* 38:6561-6570.
 143. Hunger, S., H. Cho, J. T. Sims, and D. L. Sparks. 2004. Direct speciation of phosphorus in alum-amended poultry litter: Solid-state ³¹P NMR investigation. *Environ. Sci. Technol.* 38:674 -681.

144. Nachtegaal, M. and D.L. Sparks. 2004. Effect of iron oxide coatings on zinc sorption mechanisms at the clay-mineral/water interface. *J. Colloid Interf. Sci.* 276:13-23.
145. Staats, K.E., Y. Arai, and D.L. Sparks. 2004. Alum amendment effects on phosphorus release and distribution in poultry litter amended sandy soil. *J. Environ. Qual.* 33:1904-1911.
146. Arai, Y., D.L. Sparks and J.A. Davis 2005. Arsenate adsorption mechanisms at the allophane-water interface. *Environ. Sci. Technol.* 39:2537-2544.
147. Arai, Y., K. Livi and D. L. Sparks. 2005. Phosphate reactivity in long-term poultry litter amended Southern Delaware sandy soils. *Soil Sci. Soc. of Am. J.* 69: 616-629.
148. Dowding, C.E., M.J. Borda, M.V. Fey and D. L. Sparks. 2005. A new method for gaining insight into the chemistry of drying mineral surfaces using ATR-FTIR. *J. Colloid Interf. Sci.* 292:148-151.
149. Grafe, M. and D.L. Sparks. 2005. Kinetics of zinc and arsenate co-sorption at the goethite water interface. *Geochim. Cosmochim. Acta* 69:4573-4595.
150. Hunger, S., J. T. Sims, and D. L. Sparks. 2005. How accurate is the assessment of phosphorus pools in poultry litter by sequential extraction? *J. Environ. Qual.* 34:382-389.
151. McNear, D.H., Jr., E. Peltier, J. Everhart, R. L. Chaney, S. Sutton, M. Newville, M. Rivers and D.L. Sparks. 2005. Application of quantitative fluorescence and absorption-edge computed microtomography to image metal compartmentalization in *Alyssum murale*. *Environ. Sci. Technol.* 39: 2210 -2218.
152. McNear, D. H., Jr., R. Tappero and D. L. Sparks. 2005 Shining light on metals in the environment. *Elements* 1:211-216
153. Nachtegaal, M., M. A. Marcus, J. E. Sonke, J. Vangronsveld, K. J. T. Livi, D. van Der Lelie and D. L. Sparks. 2005. Effects on in situ remediation on the speciation and bioavailability of zinc in a smelter contaminated soil. *Geochim. Cosmochim. Acta* 69:4649-4664.
154. Paul, K. W., M. J. Borda, J. D. Kubicki, and D. L. Sparks. 2005. Effect of dehydration on sulfate coordination and speciation at the Fe-(Hydr) oxide-water interface: A molecular orbital/density functional theory and Fourier transform infrared spectroscopic investigation. *Langmuir* 21:11071-11078.
155. Power, L. E., Y. Arai, and D. L. Sparks. 2005. Zinc adsorption effects on arsenite oxidation kinetics at the birnessite-water interface. *Environ. Sci. Technol.* 39:181-187.
156. Sparks, D. L. 2005. Toxic metals in the environment: The role of surfaces.

Elements 1:193-197.

157. Usher, C. R., K. W. Paul, J. Narayansamy, J. D. Kubicki, D. L. Sparks, M. A. A. Schoonen, and D. R. Strongin. 2005. Mechanistic aspects of pyrite oxidation in an oxidizing gaseous environment: An in situ-HATR-IR isotope study. *Environ. Sci. Technol.* 39:7576-7584.
158. Allada, R.K., E. Peltier, A. Navrotsky, W.H. Casey, C.A. Johnson, H.T. Berbeco and D.L. Sparks. 2006. Calorimetric determination of the enthalpies of formation of hydrotalcite-like solids and their use in the geochemical modeling of metals in natural waters. *Clays and Clay Min.* 54:409-417.
159. Arai, Y., A. Lanzirotti, S.R. Sutton, M. Newville, J. Dyer, and D.L. Sparks. 2006. Spatial and temporal variability of arsenic solid-state speciation in historically lead arsenate contaminated soil. *Environ. Sci. Technol.* 40:673-679.
160. Everhart, J.L., D. McNear, Jr., E. Peltier, D. van der Lelie, R.L. Chaney and D.L. Sparks. 2006. Assessing nickel bioavailability in smelter-contaminated soils. *Sci. of The Total Environ.* 367:732-744.
161. Liu, G., S. Debnath, K. W. Paul, W. Han, D.B. Hausner, H. Hosein, F.M. Michel, J.B. Parise, D.L. Sparks, and D.R. Strongin. 2006. Characterization and surface reactivity of ferrihydrite nanoparticles assembled in ferritin. *Langmuir* 22: 9313-9321.
162. Lee, S., J.A. Dyer, D.L. Sparks, N.C. Scrivner and E.J. Elzinga. 2006. A multi-scale assessment of Pb(II) sorption on dolomite. *J. Colloid Interface Sci.* 298:20-30.
163. Peltier, E., R. Allada, A. Navrotsky and D.L. Sparks. 2006. Nickel solubility and precipitation in soils: A thermodynamic study. *Clays and Clay Min.* 54:153-163.
164. Sparks, D.L. 2006. Milestones in soil chemistry. *Soil Sci.* 171:S47-S50.
165. McNear, D. H., Jr., R. L. Chaney, D. L. Sparks. 2007. The effects of soil type and chemical treatment on nickel speciation in refinery enriched soils: A multi-technique investigation. *Geochim. Cosmochim. Acta* 79: 2190-2208.
166. Paul, K. P., J. D. Kubicki and D. L. Sparks. 2006. Quantum chemical calculations of sulfate adsorption at the Al- and Fe-(Hydr)oxide interface- Estimation of Gibbs free energies. *Environ. Sci. Technol.* 40:7717-7724.
167. Chaney, R.L., J. S. Angle, C.L. Broadhurst, C.A. Peters, R.V. Tappero, and D.L. Sparks. 2007. Improved understanding of hyperaccumulation yields, commercial phytoextraction, and phytomining technologies. *J. Environ. Qual.* 36:1429-1443.

168. Tappero, R., E. Peltier, M. Grafe, K. Heidel, M. Ginder-Vogel, K.J.T. Livi, M.L. Rivers, M.A. Marcus, R.L. Chaney, and D.L. Sparks. 2007. Hyperaccumulator *Alyssum murale* relies on a different metal storage mechanism for cobalt than for nickel. *New Phytologist* 1-14.
169. Elzinga, E.J., and D.L. Sparks. 2007. Phosphate adsorption onto hematite: An in situ ATR-FTIR investigation of the effects of pH and loading level on the mode of phosphate surface complexation. *J. Colloid and Interface Sci.* 308:53-70.
170. Kubicki, J.D., K. D. Kwon, K.P. Paul, and D.L. Sparks. 2007. Surface complex structures modeled with quantum chemical calculations: carbonate, phosphate, sulphate, arsenate and arsenite, *European J. Soil Sci.* 58-932-944.
171. Paul, K.W., J.D. Kubicki and D.L. Sparks. 2007. Sulphate adsorption at the Fe (hydr)oxide-H₂O interface: comparison of cluster and periodic slab DFT predictions. *European J. Soil Sci.* 58:978-988.
172. Chorover, J., R. Kretzschmar, F. Garcia-Pichel and D. L. Sparks. 2007. Soil biogeochemical processes within the critical zone. *Elements* 3:321-326
173. McNear, D. H., Jr., R. L. Chaney and D. L. Sparks. 2007. The effects of soil type and chemical treatment on nickel speciation in refinery enriched soils: A multi-technique investigation. *Geochim. Cosmochim. Acta* 79:2190-2208.
174. Grafe, M., R. E. Tappero, M. A. Marcus, and D. L. Sparks. 2008. Arsenic speciation in multiple metal environments: I. Bulk-XAFS spectroscopy of model and mixed compounds. *J. Colloid Interface Sci.*
175. Grafe, M., R. E. Tappero, M. A. Marcus, and D. L. Sparks. 2008. Arsenic speciation in multiple metal environments: II. Micro-spectroscopic investigation of a CCA contaminated soil. *J. Colloid Interface Sci.*
176. Hochella, M.F., Jr., S. K. Lower, P. A. Maurice, R. L. Penn, N. Sahai, D. L. Sparks, and B. S. Twining. 2008. Nanominerals, mineral nanoparticles, and earth systems. *Science*: 319 (5870): 1631 - 1635.
177. Parikh, S.J., B.J. Lafferty and D.L. Sparks. 2008. An ATR-FTIR spectroscopic approach for measuring rapid kinetics at the mineral/water interface. *J. Colloid Interface Sci.* 320:177-185.
178. Seiter, J.M., K. E. Staats-Borda, M. Ginder-Vogel and D.L. Sparks. 2008. XANES spectroscopic analysis of phosphorus speciation in alum-amended poultry litter. *J. Environ. Qual.* 37:477-485.
179. Hunger, S., J.T. Sims and D.L. Sparks, 2008. Evidence for struvite in poultry litter: Effect of storage and drying. *J. Environ. Qual.* 37:1617-1625.
180. Shi, Z., D.M. DiToro, H.E. Allen and D.L. Sparks. 2008. A WHAM-based

kinetics model for Zn adsorption and desorption to soils. *Environ. Sci. Technol.* 42:5630-5636.

181. Kubicki, J.D., K.P. Paul, and D.L. Sparks. 2008. Periodic density functional theory calculations of bulk and the (010) surface of goethite. *Geochemical Transactions* 9:4.
182. Domagal-Goldman, S.D., K.W. Paul, D.L. Sparks and J.D. Kubicki. 2009. Quantum chemical study of the Fe(III)-desferrioxamine B siderophore complex-electronic structure, vibrational frequencies, and equilibrium Fe-isotope fractionation. *Geochim. Cosmochim. Acta* 73(1):1-12.
183. Broadhurst, C.L., R.V. Tappero, T.K. Mangel, E.F. Erbe, D.L. Sparks and R.L. Chaney. 2009. Interaction of nickel and manganese in accumulation and localization in leaves of the Ni hyperaccumulators *Alyssum murale* and *Alyssum corsicum*. *Plant Soil* 314:35-48.
184. Ginder-Vogel, M., G. Landrot, J.S. Fischel, and D.L. Sparks. 2009. Quantification of rapid environmental redox processes with quick-scanning x-ray absorption spectroscopy (Q-XAS). *Proc. National Acad. Of Sci.* 106 (38): 16124-16128.
185. Livi, K.J.T., G. S. Senesi, A.C. Scheinost and D.L. Sparks. 2009. Microscopic examination of nanosized mixed Ni-Al hydroxide surface precipitates on pyrophyllite. *Environ. Sci. Technol.* 43: 1299-1304.
186. Zhu, M., K. W. Paul, J. D. Kubicki and D.L. Sparks. 2009. Quantum chemical study of arsenic (III, V) adsorption on Mn-oxides: Implications for arsenic(III) oxidation. *Environ. Sci. Technol.* 43: 6655-6661.
187. Feng, X.H., M, Zhu, M, Ginder-Vogel, C. Ni, S. J. Parikh, and D. L. Sparks. 2010. Formation of nano-crystalline todorokite from biogenic Mn oxides. *Geochim. Cosmochim. Acta* 74:3232-3245.
188. Parikh, S.J., B. J. Lafferty, T. G. Meade and D.L. Sparks. 2010. Evaluating environmental influences on As(III) oxidation kinetics by a poorly crystalline Mn-oxide. *Environ. Sci. Technol.* 44:3772-377.
189. Lafferty, B., M. Ginder-Vogel and D.L. Sparks. 2010. Arsenite oxidation by a poorly crystalline manganese-oxide 1. Stirred-flow experiments. *Environ. Sci. Technol.* 44:8460-8466.
190. Lafferty, B., M. Ginder-Vogel, M. Zhu, K.J.T. Livi and D.L. Sparks. 2010. Arsenite oxidation by a poorly crystalline manganese-oxide 2. Results from X-ray absorption spectroscopy and X-ray diffraction. *Environ. Sci. Technol.* 44:8467-8472.
191. Landrot, G., M. Ginder-Vogel and D.L. Sparks. 2010. Kinetics of chromium(III) oxidation by manganese(IV) oxides using Quick Scanning X-ray Absorption Fine Structure Spectroscopy (Q-XAFS). *Environ. Sci.*

Technol. 44 (1): 143-149.

192. Khalid, S., W. Caliebe, P. Siddons, I. So, B. Clay, T. Lenhard, J. Hanson, Q. Wang, A. I. Frenkel, N. Marinkovic, N. Hould, M. Ginder-Vogel, G. L. Landrot, D. L. Sparks, and A. Ganjoo. 2010. Quick extended x-ray absorption fine structure instrument with millisecond time scale, optimized for in situ applications. *Rev. Sci. Instrum.* 81: 015105.
193. McNear, D. H. Jr. , R. L. Chaney and D.L. Sparks. 2010. The hyperaccumulator *Alyssum murale* uses complexation with nitrogen and oxygen donor ligands for Ni transport and storage. *Phytochemistry* 71:188-200.
194. Peltier, E., D. van der Lelie and D.L. Sparks. 2010. Formation and stability of Ni-Al hydroxide phases in soils. *Environ. Sci. Technol.* 44 (1): 302-308.
195. Shimizu, M., M. Ginder-Vogel, S. J. Parikh and D.L. Sparks. 2010. Molecular scale assessment of methylarsenic sorption on aluminum oxide. *Environ. Sci. Technol.* 44(2):612-617.
196. Zhu, M., M. Ginder-Vogel, S.J. Parikh, X. Feng and D.L. Sparks. 2010. Cation effects on the layer structure of biogenic Mn-oxides. *Environ. Sci. Technol.* 44: 4465-4471.
197. Zhu, M., M. Ginder-Vogel and D.L. Sparks. 2010. Ni(II) Sorption on biogenic Mn-oxides with varying Mn octahedral layer structure. *Environ. Sci. Technol.* 44:4472-4478.
198. 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. *Environ. Sci. Technol.* 45 (10): 4249-4255.
199. Lafferty, B., M. Ginder-Vogel and D. L. Sparks. 2011. Arsenite oxidation by a poorly crystalline manganese-oxide 3. Arsenic and manganese desorption. *Environ. Sci. Technol.* 45(12):9218-9233.
200. Li, T., Z. Di, X. Yang and D.L. Sparks. 2011. Effects of dissolved organic matter from the rhizosphere of the hyperaccumulator *Sedum alfredii* on sorption of zinc and cadmium by different soils. *J. Hazard. Mater.* 192(3):1616-1622.
201. Parikh, S.J., J.D. Kubicki, C. M. Jonsson, C. L. Jonsson, R. M. Hazen, D. A. Sverjensky and D.L. Sparks. 2011. Evaluating glutamate and aspartate binding mechanisms to rutile (α -TiO₂) via ATR-FTIR spectroscopy and quantum chemical calculations. *Langmuir* 27 (5): 1778-1787.
202. Livi, K.J.T., B. Lafferty, M. Zhu, S. Zhang, A. Gaillota and D.L. Sparks. 2012. Electron energy-loss safe-dose limits for manganese valence

- measurements in environmentally relevant manganese oxides. Environ. Sci. Technol. 46 (2): 970-976.
203. Shi, Z., E. Peltier, and D. L. Sparks. 2012. Kinetics of Ni sorption in soils: Roles of soil organic matter and Ni precipitation. Environ. Sci. Technol. 46: (4) 2212-2219.
 204. Shimizu, M., Y. Arai and D.L. Sparks. 2011. Multiscale assessment of methylarsenic reactivity in soil. 2. Distribution and speciation in soil. Environ. Sci. Technol. 45 (10): 4300-4306
 205. Shimizu, M., Y. Arai and D.L. Sparks. 2011. Multiscale assessment of methylarsenic reactivity in soil. 1. Sorption and desorption on soils. Environ. Sci. Technol. 45(10): 4293-4299.
 206. Wang Q. ,E. Iriowen, S. Yuan, D.L. Sparks. 2011. Impact of sediment from St. Jones River, Delaware, USA on microbial functional stability in two local soils. J Bioremed Biodegrad S1:005.
 207. Zhu, M., C. L. Farrow, J. E. Post, K. J.T. Livi, S.J.L. Billinge, M. Ginder-Vogel and D.L. Sparks. 2012. Structural study of biotic and abiotic poorly-crystalline manganese oxides using atomic pair distribution function analysis. Geochim. Cosmochim. Acta 81:39-55.
 208. Centofanti, T., M. G. Siebecker, R. L. Chaney , A.P. Davis, D. L. Sparks. 2012. Hyperaccumulation of nickel by *Alyssum corsicum* is related to solubility of Ni mineral species. Plant Soil 359: 71-83.
 209. Jones, L.C., B.J. Lafferty and D.L. Sparks. 2012. Additive and competitive effects of bacteria and Mn oxides on arsenite oxidation kinetics. Environ. Sci. Technol. 46 (12): 6548-6555.
 210. Landrot, G., R. Tappero, S.M. Webb and D.L. Sparks. 2012. Arsenic and chromium speciation in an urban contaminated soil. Chemosphere 88 (10): 1196-1201.
 211. Khaokaew, S., G. Landrot, R.L. Chaney, K. Pandya, and D.L. Sparks. 2012. Speciation and release kinetics of zinc in contaminated paddy soils. Environ. Sci. Technol. 46 (7): 3957-3963.
 212. Landrot, G., M. A. Ginder-Vogel, K. J. Livi, J. P. Fitts, and D. L. Sparks. 2012. Chromium(III) oxidation by three poorly-crystalline manganese(IV) oxides 1. Chromium(III)-oxidizing capacity. Environ. Sci. Technol. 46: (21) 11594-11600.
 213. Landrot, G., M. A. Ginder-Vogel, K. J. Livi, J. P. Fitts and D. L. Sparks. 2012. Chromium(III) oxidation by three poorly-crystalline manganese(IV) oxides 2. Solid phase analyses. Environ. Sci. Technol. 46: (21) 11601-11609.

214. Li, W., K. J. Livi, W. Xu, M. G. Siebecker, Y.-J. Wang, B. L. Phillips, and D. L. Sparks. 2012. Formation of crystalline Zn-Al layered double hydroxide precipitates on γ -alumina: The role of mineral dissolution. *Environ. Sci. Technol.* 46: (21) 11670-11677.
215. Lami, R., L. C. Jones, M. Cottrell, B. Lafferty, M. Ginder-Vogel, D. L. Sparks and D. Kirchman. 2013. Arsenite modifies structure of soil microbial communities and arsenite oxidization potential. *FEMS Microbiology Ecology*. 84:270-279.
216. Wang, X., F. Liu, W. Tan, W. Li, X. Feng and D. L. Sparks. 2013. Characteristics of phosphate sorption-desorption onto ferrihydrite: Comparison with crystalline Fe (hydro)oxides. *Soil Science* 178, 1–11.
217. Shi, Z., D. M. Di Toro, H. E. Allen, and D. L. Sparks. 2013. A general model for kinetics of heavy metal adsorption and desorption on soils. *Environ. Sci. Technol.* 47(8):3761–3767.
218. Li, W., Y. Wang, M. Zhu, T.-T. Fan, D.-M. Zhou, B. L. Phillips and D. L. Sparks. 2013. Inhibition mechanism of Zn precipitation on aluminum oxide by glyphosate: A ^{31}P NMR and Zn EXAFS Study. *Environ. Sci. Technol.* 47(9):4211-4219.
219. Agrawal, B., K. Czymmek, D.L. Sparks, and H.P. Bais. 2013. Transient influx of nickel in root mitochondria modulates organic acid and reactive oxygen species production in nickel hyperaccumulator *Alyssum murale*. *J. Biol. Chem.* 288(10):7351-7362.
220. Li, T., Z. Xu, X. Han, X. Yang and D. L. Sparks. 2013. Characterization of dissolved organic matter in the rhizosphere of hyperaccumulator *Sedum alfredii* and its effect on the mobility of zinc. *Chemosphere* 88 (5): 570–576.
221. Zhu, M., P. Northrup, C. Shi, S. j. L. Billinge, D. L. Sparks and G. A. Waychunas. 2013. Structure of sulfate adsorption complexes on ferrihydrite. *Environ. Sci. Technol.* (In Press)
222. Wang, X., W. Li, R. Harrington, F. Liu, J. B. Parise, X. Feng and D. L. Sparks. 2013. Effect of ferrihydrite crystallite size on phosphate adsorption reactivity. *Environ. Sci. Technol.* 47 (18):10322-10331.
223. Chimchart, B., I. Kheoruenromne, A. Suddhiprakarn and D. L. Sparks. 2013. Role of organic matter on charge behavior of oxisols and ultisols under tropical Savanna and tropical monsoon climates in Thailand. *Soil Sci.* 178(10): 540-549.
224. Elbana, T. A., D. L. Sparks and H. M. Selim. 2014. Transport of tin and lead in soils: Miscible displacement experiments and second-order modeling. *Soil Sci. Soc. Am. J* (In Press).

225. Yan, Y. P., F. Liu Jr., W. Li, X. H. Feng and D. L. Sparks. 2014. Sorption and desorption characteristics of organic phosphates of different structures on aluminum (oxyhydr)oxides. *European J. Soil Sci.* (Online version)

E. Invitational Papers and Presentations at Symposia

1. Sparks, D.L. 1980. Kinetics and thermodynamics of potassium exchange in pure and in mixed systems. "Chemistry in the Soil Environment: Ion Exchange Symposium", Soil Science Society of America Meetings, Detroit, Michigan.
2. Jardine, P.M., and D.L. Sparks. 1982. Thermodynamics and kinetics of K-Ca exchange in soil. 56th Colloid and Surface Science Symposium, Blacksburg, Virginia, June 13-16.
3. Sparks, D.L. 1982. The role of boron in plant nutrition. Boron Symposium sponsored by U.S. Borax Corporation.
4. Sparks, D.L. 1982. Chemistry of soil potassium in Atlantic Coastal Plain Soils, Eastern Soil Fertility Symposium, Salisbury, Maryland.
5. Sparks, D.L. 1982. Ionic activities: An historical and theoretical overview. "Chemistry in the Soil Environment: Ion Exchange Symposium", Soil Science Society of America Meetings, Anaheim, California.
6. Sparks, D.L. 1983. On the kinetics of ion exchange in heterogeneous systems. Visiting scholar at the University of Kentucky, Lexington, Kentucky.
7. Sparks, D.L. 1984. Dynamics of soil potassium. Visiting Scholar, Rutgers University, New Brunswick, New Jersey.
8. Sparks, D.L. 1984. Kinetics and thermodynamics of potassium exchange in clay minerals, Symposium on Clay Mineralogy, Calgary, Canada, August, 1984.
9. Sparks, D.L. 1984. Chemistry of potassium on Atlantic Coastal Plain soils. Visiting Scholar, University of Maryland, College Park, Maryland, May, 1984.
10. Sparks, D.L. 1984. Kinetics and thermodynamics of potassium exchange in soils. Visiting Scholar, The Ohio State University, Columbus, Ohio, October, 1984.
11. Sparks, D.L. 1985. Soil chemistry applications to soil management systems. Visiting Scholar, The Pennsylvania State University, University Park, Pennsylvania, February, 1985.
12. Sparks, D.L. 1985. Kinetics of ionic exchange in pure and in mixed

systems. Visiting Scholar, Savannah River Ecology Laboratory, Aiken, South Carolina, April, 1985.

13. Sparks, D.L., and P.M. Huang. 1985. The physical chemistry of soil potassium. International Potassium Symposium, Atlanta, Georgia, July, 1985.
14. Sparks, D.L. 1985. Dynamics of soil potassium. Visiting Scholar, University of Saskatchewan, Saskatoon, Canada, October, 1985.
15. Sparks, D.L. 1986. Kinetics of ion exchange on soils and clay minerals. Visiting Professor Lecture, University of California, Riverside, Riverside, California, February, 1986.
16. Sparks, D.L. 1986. Dynamics of potassium exchange in soils and clay minerals. Visiting Professor, University of California, Riverside, Riverside, California, March, 1986.
17. Sparks, D.L. 1986. Physical chemistry of soil potassium. Visiting Scholar, University of California, Berkeley, Berkeley, California, March, 1986.
18. Sparks, D.L. 1986. Boron movement in the soil, uptake by the plant and rates required to correct a deficiency on different soil types, Boron Symposium, Richmond, Virginia, August, 1986.
19. Sparks, D.L. 1986. Potassium release from interlayers. International Potassium Congress, Reims, France, August, 1986.
20. Sparks, D.L. 1986. Elucidation of rate-limiting steps for ion exchange processes on clay mineral surfaces. Clay Surface and Colloid Symposium, Clay Minerals Society Meeting, Jackson, Mississippi, October, 1986.
21. Sparks, D.L. 1986. Kinetics of reactions on soil constituents. Visiting Scholar, Virginia Polytechnic Institute and State University, Blacksburg, VA, October, 1986.
22. Sparks, D.L. 1986. Kinetics of soil chemical processes. Soil chemistry invitational symposium. Soil Science Society of America Meeting, New Orleans, Louisiana.
23. Sparks, D.L. 1987. Chemistry of soil boron. U. S. Borax Corporation Research Division, Anaheim, CA, March, 1987.
24. Sparks, D.L. 1987. Physical chemistry of soil potassium. Lecture Series in Beijing, Nanjing, Wuhan, Hangzhou, and Ghangzhou, China, September, 1987.
25. Sparks, D.L. 1988. Kinetics of soil chemical processes. USDA-ARS Eastern Regional Laboratory, Philadelphia, PA, May, 1988.

26. Sparks, D.L. 1988. Release of boron from soil organic matter. U. S. Borax Symposium, Louisville, KY, July, 1988.
27. Sparks, D.L., and C.P. Schulthess. 1988. Modeling chemical sorption on soils and soil constituents. Soil Chemistry Invitational Symposium. Soil Science Society of America Meeting, Anaheim, California.
28. Sparks, D.L. 1989. Kinetics of soil chemical processes. Lecture Series in Bet-Dagan and Haifa, Israel, March, 1989.
29. Sparks, D.L. 1989. Kinetics of reactions on soils and soil constituents and chemical sorption phenomena on soils and soil constituents. Willie Woltz Distinguished Lecturer. North Carolina State University, Raleigh, N.C., April, 1989.
30. Sparks, D.L. 1989. Chemical kinetics and mass transfer processes in soils and soil constituents. NATO Advanced Study Institute Lecturer, July 9-16, Pullman, Washington.
31. Sparks, D.L., and P.C. Zhang. 1989. Relaxation methods for studying kinetics of soil chemical phenomena. Kinetics of Soil Physicochemical Processes International Symposium. Soil Science Society of America Meeting, Las Vegas.
32. Aharoni, C., and D.L. Sparks. 1989. Application of chemical kinetics to heterogeneous soils. Kinetics of Soil Physicochemical Processes International Symposium. Soil Science Society of America Meeting, Las Vegas.
33. Sparks, D.L. 1990. Kinetics of soil chemical processes: An overview. The invitational speaker in Kinetics of Ion Sorption on Soils Symposium, International Soil Science Congress, Kyoto, Japan.
34. Bar-Tal, A., S. Feigenbaum, and D.L. Sparks. 1990. Dynamics of soil potassium in multicationic systems. International Potash Institute Symposium, Minsk, Russia.
35. Zhang, Z.Z., P.C. Zhang, and D.L. Sparks. 1991. Dynamics and mechanisms of organic pollutant interactions on clay minerals. The Colloidal and Surface Chemistry of Clays Symposium, Am. Chem. Soc. Meeting, Atlanta, GA.
36. Sparks, D.L. 1991. Kinetics of metal sorption reactions. Metal Speciation and Contamination of Soil Workshop, Jekyll Island, GA, May 22-24.
37. Sparks, D.L. 1991. Physical chemistry of potassium. Justus von Liebig Univ., Giessen, Germany, August, 1991.
38. Sparks, D.L. 1991. Kinetics of soil chemical processes. Institut für Strahlenschutz, Neuherberg, Germany.

39. Sparks, D.L., S.E. Fendorf, P.C. Zhang, and L. Tang. 1992. Kinetics and mechanisms of environmentally important reactions on soil colloidal surface, NATO-ASI "Migration and fate of pollutants in soils and subsoils". May, 1992, Maratea, Italy.
40. Sparks, D.L. 1992. Soil and environmental chemistry research in the Northeastern USA: Challenges and opportunities for the 1990's. Northeastern Branch, American Society of Agronomy, Meeting, Storrs, CT, June, 1992.
41. Sparks, D.L. 1992. Advising M.S. graduate students. SSSA Symposium "Soil science education: Philosophy and perspectives". SSSA Meeting, Minneapolis, Minnesota, October, 1992.
42. Sparks, D.L., and S.E. Fendorf. 1992. Rapid reaction kinetic techniques. Goldschmidt Conference, Reston, VA, May, 1992.
43. Sparks, D.L. 1993. The physical chemistry of soil potassium. Rothamsted Experimental Station, Harpenden, England. June, 1993.
44. Sparks, D.L. 1993. Surface chemistry of soils. University of Birmingham, Birmingham, England. July, 1993.
45. Sparks, D.L. 1993. Kinetics and mechanisms of environmentally important reactions in soils and on soil components. Lancaster University, Lancaster, England. July, 1993.
46. Fendorf, S.E., P.R. Grossl, and D.L. Sparks. 1993. Oxyanion surface structures on goethite. Soil Sci. Soc. Am. Meetings, Minneapolis, MN., November, 1993.
47. Sparks, D.L. 1993. Sorption of hydrolyzable ions on oxide surfaces. The Johns Hopkins University, Baltimore, MD. October, 1993.
48. Steffens, D., and D.L. Sparks. 1994. Effects of aging on the kinetics of nonexchangeable ammonium-nitrogen release from soils and clays. SSSA Meeting, Seattle, WA.
49. Eick, M.J., D.L. Sparks, D.C. Golden, and D.W. Ming. 1994. Dissolution of a lunar glass simulant: The effect of pH and organic acids at 298K. SSSA Meeting, Seattle, WA.
50. Stapleton, M.G., D.L. Sparks, and S.K. Dentel. 1994. Kinetics and mechanisms of pentachlorophenol sorption/desorption with an organo-clay. SSSA Meeting, Seattle, WA.
51. Fendorf, S.E., D.L. Sparks, and M. Fendorf. 1994. Mechanism of aluminum sorption on birnessite: Influences on chromium oxidation. Int. Soil Sci. Congr., Acapulco, Mexico.

52. Fendorf, S.E., and D.L. Sparks. 1994. Application of surface spectroscopies and microscopies to elucidate sorption mechanisms on oxide surfaces. Int. Soil Sci. Congr., Acapulco, Mexico.
53. Scheidegger, A.M., and D.L. Sparks. 1995. Kinetics of the formation and the dissolution of nickel precipitates on pyrophyllite. Am. Chem. Soc. Meeting, April 6, Anaheim, CA.
54. Scheidegger, A.M., G. M. Lamble, and D. L. Sparks. 1995. Nickel speciation using in-situ spectroscopic and microscopic approaches. 3rd International Conference on Biogeochem. of Trace Elements, May 15-19, Paris, France.
55. Sparks, D.L. 1995. Kinetics of environmentally important reactions on natural materials. Visiting Scholar, Univ. of Saskatchewan, Saskatchewan, Canada.
56. Sparks, D.L. 1995. Kinetics and mechanisms of metal sorption/desorption on oxides. Swiss Federal Institute of Technology, Zurich, Switzerland.
57. Scheidegger, A.M., G.M. Lamble, and D.L. Sparks. 1996. Monitoring the kinetics of metal surface precipitate formation using x-ray absorption fine structure spectroscopy. Symposium on sorption of metals by earth materials. American Chemical Society National Meeting, New Orleans, LA, March 1996.
58. Strawn, D.G., and D.L. Sparks. 1996. Influence of aging on the kinetics of Pb release from soil. American Chemical Society National Meeting, New Orleans, LA, March 1996.
59. Scheidegger, A.M., G.M. Lamble, and D.L. Sparks. 1996. The kinetics of mixed Ni-Al hydroxide formation on clays and aluminum oxides as monitored by X-ray absorption fine structure (XAFS) spectroscopy. The 9th International Conference on X-ray Absorption Fine Structure, Grenoble, France, August 1996.
60. Sparks, D.L., A.M. Scheidegger, D.G. Strawn, and A.M. Brennan. 1996. Mechanisms of slow metal sorption on soils: An overview. Soil Sci. Soc. Am. Meeting, Indianapolis, IN, November 1996.
61. Sparks, D.L. 1997. Applications of soft x-ray radiation to the study of important inorganic species. Molecular Environmental Science in the Soft X-ray Region Workshop. Lawrence Berkeley National Laboratory, Univ. of California, Berkeley, CA, March 27-28.
62. Sparks, D.L., A.M. Scheidegger, D.G. Strawn, and K.G. Scheckel. 1997. Kinetics and mechanisms of metal cation sorption at the mineral/water interface. In Kinetics and Mechanisms of Reactions at the Mineral/Water Interface. D.L. Sparks and T.J. Grundl (Co-Organizers) 213th Am. Chem. Soc. Meeting, San Francisco, CA, April 13-17.

63. Strawn, D.G., and D.L. Sparks. 1997. Sorption kinetics of trace elements in soils and soil materials. 4th Intern. Conf. on the Biogeochemistry of Trace Elements, Univ. of California, Berkeley, June 23-26.
64. Sparks, D.L. 1997. Kinetics and mechanisms of metal sorption at the mineral/water interface: A molecular approach. Paul Scherrer Institute, Villigen, Switzerland, August 26.
65. Sparks, D.L. 1997. Kinetics and mechanisms of sorption on soil minerals: A molecular approach. DuPont Thermodynamics, Kinetics, and Mechanisms symposium, DuPont Co., Wilmington, Delaware, November 3.
66. Sparks, D.L. 1998. Kinetics and mechanisms of metal sorption at the mineral/water interface: A molecular approach. Iowa, State University, Ames, Iowa, April, 1998.
67. Scheidegger, A.M., D.G. Strawn, D.R. Roberts, K.G. Scheckel, and D.L. Sparks. 1998. The dynamics of metal adsorption and surface precipitate formation on soil materials as monitored by surface molecular techniques. 16th World Congress of Soil Science, 20-26 August, Montpellier, France.
68. Scheinost, A.C., R.G. Ford, and D.L. Sparks. 1998. Characterization of polynuclear Ni species at the surface of phyllosilicates, gibbsite and amorphous silica using diffuse reflectance spectroscopy. V.M. Goldschmidt Conference, Toulouse, France, Mineralogical Mag. Vol. 62A:1332-1333. August 30-September 3.
69. Ford, R.G., and D.L. Sparks. 1998. Advances in understanding the mechanisms and rates of sorption phenomena for inorganic solutes in soils. SSSA Meeting, Baltimore, Oct. 18-22.
70. Ford, R.G., and D.L. Sparks. 1998. Potential formation of secondary hydrotalcite like precipitates during Zn and Cu sorption to pyrophyllite. V.M. Goldschmidt Conference, Toulouse, France, Mineralogical Mag. Vol. 62A:462-463.
71. Sparks, D.L. 1999. Frontiers in fundamental research on metal retention at natural surfaces. Symposium on RMetals in the Environment: From Fundamental Research to Industrial Applications, DuPont Co., February 8, Wilmington, Delaware.
72. Sparks, D.L. 1999. Kinetics and mechanisms of metal sorption and precipitate transformation on soil minerals at the molecular scale. Texas A&M University, Dept. of Soil and Crop Sciences, College Station, TX, March 10.
73. Sparks, D.L. 1999. Surface precipitation in soils: Implications for metal mobility in the subsurface environment. Dept. of Civil and Environmental Engineering, Univ. of Delaware, April, 22.

74. Sparks, D.L. 1999. Metal sorption rates and mechanisms at the mineral-water interface. Chemistry Dept., Northeastern University, Boston, Massachusetts, May 20.
75. Sparks, D.L. 1999. Metal sorption at soil mineral surfaces: A continuum from adsorption to precipitation. Dept. of Geological and Environ. Sciences, Stanford Univ., Palo Alto, California, June 21.
76. Sparks, D.L. 1999. Kinetics of reactions at the soil mineral/water interface. Plenary lecture of symposium "Reaction Kinetics: Linkage Between Soil Science and Plant Nutrition". Hohenheim Univ., Stuttgart, Germany.
77. Sparks, D.L. 1999. Frontiers in metal sorption kinetics and mechanisms at the mineral/water interface. Environmental Chemistry and Transport Symposium, Wiley Environ. Molecular Sciences Lab, Pacific Northwest National Laboratory, Richland, Washington, July 21.
78. Peak, J.D., and D.L. Sparks. 1999. Kinetics of oxyanion sorption on metal oxides: A time-resolved ATR-FITR spectroscopic study. 5th Int. Conf. on the Biogeochemistry of Trace Elements, July 11-15, Vienna, Austria
79. Elzinga, E.J., and D.L. Sparks. 1999. Adsorption mechanisms of lead on amorphous silica. 5th Int. Conf. on the Biogeochemistry of trace elements. July 11-15, Vienna, Austria.
80. Sparks, D.L. 2000. The role of molecular environmental science in advancing the frontiers of metal speciation in natural systems. Chemical Engineering IGERT (NSF) Program, Washington State Univ., March.
81. Sparks, D.L. 2000. Metal sorption/release on mineral surfaces. Soil and Crop Sciences Dept., Washington State Univ., March.
82. Sparks, D.L. 2000. Soil chemistry: Past Progress and Future Frontiers. IUSS Mid-Congress Symposium, Bangkok, Thailand, April.
83. Sparks, D.L. 2000. Metal precipitation and dissolution at the mineral/water interface, Rutgers University, New Brunswick, New Jersey, April.
84. Sparks, D.L. 2000. Series of 10 lectures on kinetics and surface chemistry of soils. University of Bari, Bari, Italy, May.
85. Sparks, D.L. 2000. Advances in understanding the kinetics and mechanisms of metal sorption at the mineral/water interface. Keynote Lecture. Third International Symposium of the Working Group M.O. "Interactions of Soil Minerals with Organic Contaminants and Microorganisms", Naples, Italy, May 22-26.

86. Sparks, D.L. 2000. Metal sorption and precipitation at the soil mineral/water interface: Implications for sequestration and remediation. Department of Land, Air and Water Resources, University of California-Davis, Davis, California, October.
87. Sparks, D.L. 2000. The role of molecular environmental science in advancing the frontiers of contaminant speciation. Nanophases in the Environment, Agriculture, and Technology (NEAT) Center, University of California-Davis, Davis, California, October.
88. Sparks, D.L. 2000. Frontiers in elucidating metal sorption mechanisms at the soil mineral water/interface using molecular scale techniques. Keynote Lecture, "Surface Chemical Processes in Natural Environments ymposium", Monte Verita, Ascona, Switzerland, October 1-6.
89. Sparks, D.L. 2001. Metal sorption kinetics and mechanisms at the mineral/water interface: Implications for sequestration and remediation. State University of New York, Stony Brook, New York, April 12.
90. Sparks, D.L. 2001. The role of molecular environmental science in advancing the frontiers of contaminant speciation and dynamics in natural systems. Harvard University, Cambridge, Massachusetts, April 19.
91. Sparks, D.L. 2001. Speciation of As and Zn in contaminated soils using micro-focused x-ray absorption spectroscopy. Brookhaven National Laboratory, Upton, New York, May 21.
92. Sparks, D.L. 2001. Frontiers in elucidating metal sorption mechanisms at the mineral/water interface: From the macroscopic to the molecular scale. Keynote Speaker in Environmental Surface Chemistry Symposium of 75th ACS Colloid and Surface Science Symposium, Carnegie-Mellon Univ., Pittsburgh, Pennsylvania, June 10-13.
93. Sparks, D.L. 2001. Frontiers in assessing the role of chemical speciation and natural attenuation on the bioavailability of contaminants in the terrestrial environment. Plenary talk at Bioavailability 2001-Chemical Bioavailability in the Terrestrial Environment, Adelaide, South Australia, CSIRO, November 18-20.
94. Sparks, D.L. 2001. Frontiers in assessing the role of chemical speciation and natural attenuation on the fate of contaminants in soils. CSIRO, Western Australia, Perth, Australia. November.
95. Sparks, D.L. 2001. The role of molecular environmental science in advancing the frontiers of chemical speciation and dynamics in natural systems. CSIRO, Canberra, Australia. November.
96. Sparks, D.L. 2001. The role of molecular environmental science in advancing the frontiers of chemical speciation and dynamics in natural systems. CSIRO, University of Melbourne, Australia. November.

97. Ford, R.G., Y. Arai and D.L. Sparks. 2001. Approaches to characterizing solid phase arsenic speciation in soils. 17th Int. Conf. On Contaminated Soils, Sediments and Water, October 22-25, Univ. of Massachusetts, Amherst, Massachusetts.
98. Sparks, D.L. 2002. Kinetics and mechanisms of metal sorption/desorption on natural materials: A multi-scale approach. University of Kentucky, Agronomy Dept., March.
99. Sparks, D.L. 2002. The role of synchrotron radiation in advancing frontiers in environmental soil science. Keynote Address, Synchrotron Environmental Science, May 6-8, Argonne National Laboratory, Advanced Photon Source, Argonne, Illinois.
100. Sparks, D.L. 2002. Metal sorption on soil mineral surfaces. Nanogeoscience Workshop, Lawrence Berkeley National Laboratory, Berkeley, California, June 14-16.
101. Sparks, D.L. 2002. The role of molecular scale investigations in advancing the frontiers of contaminant speciation and bioavailability in soils. Keynote Paper, Bouyoucos Conference on Molecular Level Processes Controlling Availability of Chemical Species to Plants and Microbes in Soil. June 23-27, Kassandra, Halkidiki, Greece.
102. Sparks, D.L. 2002. It's about scale and interfaces: Frontiers in basic soil science research. Plenary Address, 17th World Congress of Soil Science, August 13-21, Bangkok, Thailand.
103. Sparks, D.L. 2002. It's about scale and interfaces: From the landscape to the molecular. S. Hallock du Pont Inaugural Lecture, DBI, May 19.
104. Sparks, D.L. 2002. Frontiers in contaminant fate and speciation: It's about scale and interfaces. Princeton University, Princeton, New Jersey, October 10.
105. Sparks, D.L. 2002. Frontiers in contaminant fate and speciation: It's about scale and interfaces. USGS, Menlo Park, California, October 16.
106. Sparks, D. L. 2003. Frontiers in basic soil science research: grand challenges and opportunities. 26th Congress of the Polish Society of Soil Science, Plenary Presentation, Krakow, Poland. September 8-10.
107. Sparks, D. L. 2003. Frontiers in contaminant fate and speciation. The role of synchrotron radiation Keynote presentation. IUPAC, Canadian Chemical Society, Canadian Light Source, Ottawa, Canada, August 10-14.
108. Gräfe, M., D. L. Sparks, A. Lanzirrotti and M. Marcus. 2003. In-situ speciation of arsenic contaminated soil using synchrotron based micro-focused X-ray fluorescence and X-ray absorption spectroscopy. 7th International Conference On The Biogeochemistry of Trace Elements. Uppsala, Sweden,

June 15-19.

109. Dyer, J. A., N. C. Scrivner, B. Fritzler, P. Trivedi, D. L. Sparks, and S. Sanders. 2003. Predicting trace-metal fate in aqueous systems using a coupled equilibrium-surface-complexation, dynamic-simulation model. 2nd Int., Symp. on Underground Injection Science and Technology. LBNL, Berkeley, California. October 22-25.
110. Trivedi, P., D. L. Sparks, J. A. Dyer, N. C. Scrivner, and K. Pandya. 2003. Short-and long-term fate of trace metal contaminants in anoxic aqueous environments as a function of background-electrolyte and temperature. 2nd Int. Symp. on Underground Injection Science and Technology. LBNL, Berkeley, California. October 22-25.
111. Nachtegaal, M., C. J. Jacobsen, and D. L. Sparks. 2003. X-ray microscopic and NEXAFS spectroscopic studies of humic substances and their metal binding affinity. Environmental Molecular Science Workshop at NSLS User Meeting, National Synchrotron Light Source, Brookhaven National Laboratory, Upton, New York.
112. Sparks, D. L., 2004. Shedding Light on Soil Contamination and Remediation: The Role of Synchrotron Radiation, Roscoe Ellis, Jr. Lecturer, Kansas State University, Manhattan, Kansas, March 17.
113. Sparks, D.L. 2004. It's About Scale and Interfaces: Soil Chemistry from the Landscape to the Molecular. Kansas State University, Manhattan, Kansas, March 18.
114. Sparks, D. L. 2004. Kinetics and mechanisms of metal sorption at the soil mineral/water interface. The continuum from adsorption to precipitation. Keynote Lecture, in "Chemistry of Metals in Terrestrial Aquatic Systems" symposium. 227th Am. Chem. Soc. National Meeting, Anaheim, California March 28 - April 1.
115. Sparks, D.L. 2004. The role of synchrotron radiation in advancing the frontiers of water-rock interactions. Keynote speaker. Proceedings of the Eleventh International Symposium on Water-Rock Interaction WRI-11. Saratoga Springs, New York. June 27 - July 2.
116. Borda, M.J., D.L. Sparks, M.A.A. Schoonen, and D.R. Strongin. 2004. Using time-lapse ATR-FTIR spectroscopy to investigate reactions at the water-rock interface. Proceedings of the Eleventh International Symposium on Water-Rock Interaction WRI-11. Saratoga Springs, New York. June 27-July 2.
117. Dyer, J.A., N.C. Scrivner and D.L. Sparks. 2004. Coupling uncertainty analysis with a surface complexation model. Proceedings of the Eleventh International Symposium on Water-Rock Interaction WRI-11. Saratoga Springs, New York. June 27 - July 2.

118. Sparks, D.L., 2004. Multi-scale assessment of ion sorption kinetics at the mineral/water interface. Keynote speaker. 228th ACS National Meeting, Philadelphia, Pennsylvania August 22-26.
119. Sparks, D.L. 2004. Shedding light on metal speciation at mineral surfaces: The role of synchrotron-based spectroscopic techniques. Keynote speaker. 228th ACS National Meeting, Philadelphia, Pennsylvania. August 22-26.
120. Sparks, D.L. 2004. Shedding light on remediation of polluted soils. The role of synchrotron radiation. Keynote speaker. Eurosoil 2004, Freiburg, Germany. September 9.
121. Sparks, D.L. 2004. Grand challenges and opportunities in basic soil science research and the discipline of soil science. Plenary speaker. Super Soil 2004. Sydney, Australia, December 5.
122. Paul, K., M. Borda, J. Kubicki, D. Sparks. 2005. SO₄²⁻ coordination and speciation at the Fe-(Hydr)oxide-H₂O Interface: MO/DFT & FTIR Results. IUSS Symposium, Voerlamm, October.
123. Sparks, D.L. 2005. Kinetics of Chemical Reactions in Environmental Systems: Research Needs and Challenges. Keynote Talk NSLS Users Meeting, In-situ Analyses in Environmental Systems, Brookhaven National Laboratory, Upton, New York, May 23-25.
124. Sparks, D.L. 2005 The Role of XAFS in Advancing the Frontiers of Molecular Environmental Science. Keynote Talk 4th Summer School of Condensed Matter Research, Zuzwil, Switzerland, August 14-21.
125. Sparks, D.L. Advances in Elucidating Biogeochemical Processes in Soils: It's About Scale and Interfaces. Keynote Talk. 7th International Symposium of Geochemistry of the Earth's Surface (GES-7), Aix-en-Provence. August 23-27.
126. Sparks, D.L. Grand Challenges and Opportunities in the Environmental Sciences: The Importance of Basic Research and Technology. Sterling B. Hendricks Memorial Lecture, American Chemical Society Meeting, Washington, D.C., August 31.
127. Sparks, D.L. Frontiers in Contaminant Speciation and Reactivity in Terrestrial Environments: The Role of Synchrotron Radiation. Plenary Talk. Japanese Society of Soil Science and Plant Nutrition Meeting, Matsue, Japan, September 6-8.
128. Sparks, D.L. Frontiers in Soil Science: Technology and the Information Age. Plenary Talk. Frontiers of Soil Science-Messages from Soil Scientists in Asia, Japan Council of Science, Tokyo, Japan, September 12.
129. Sparks, D.L. Future Directions in Basic Soil Science Research:

- Opportunities and Challenges. Plenary Talk. International Symposium 2005, Application of Emerging Soil Science Research and its Role in the Conservation of Agricultural Ecosystems, Seoul, Korea, September 28-29.
130. Sparks, D.L. Complex Environmental Systems/Ecosystem Health. Governor Minner's Council on Science and Technology, Delaware Biotechnology Institute, Newark, Delaware, October 4.
 131. Tappero, R., M. Marcus, E. Peltier, R. L. Chaney and D. L. Sparks. Plant-Metal-Soil Interactions: Results from synchrotron-based X-ray fluorescence (SXRF), X-ray absorption spectroscopy (XAS), and computed microtomography (CMT). Synchrotron Environmental Sciences III (SES III) Workshop, Brookhaven, National Lab, Upton, New York September 20.
 132. Paul, K.W., M. J. Borda, J. D. Kubicki and D. L. Sparks. 2005. How Dehydration Affects SO₄²⁻ Adsorption at the Fe-(Hydr)oxide-H₂O Interface. IUSS Symposium Advances of Molecular Modeling Perspectives for Soil Research. University of Natural Resources and Applied Life Sciences, Vienna, Austria, October 21-22.
 133. McNear, D. H. and D. L. Sparks. 2005. Using synchrotron-based techniques to explore heavy metal interactions at the plant-soil-water interface. Canadian Light Source Inc. Annual Users' Meeting and Workshops, Saskatoon, Saskatchewan, Canada, November 18-20.
 134. Tappero, R. and D. L. Sparks. 2006. Root-induced changes in metal speciation in the rhizosphere and metal homeostasis in a Ni/Co hyperaccumulator: A spectromicroscopic investigation. 16th Annual V.M. Goldschmidt Conference, Melbourne, Australia.
 135. Sparks, D.L. 2006. Use of X-ray Absorption Spectroscopy in Advancing the Frontiers of Interfacial Geochemistry. Keynote Talk. Spectroscopy of Interfaces: Geochemistry Interfaces. 231st Am. Society Chemistry National Meeting, Atlanta, Georgia, March 26-30.
 136. Sparks, D.L. 2006. Advances in Understanding Hydrobiogeochemical Processes Important in Soil Protection. Invited Talk. 17th International Soil Tillage Research Organization Conference, "Sustainability- Its Impact on Soil Management and Environment", Kiel, Germany, August 28-September 3.
 137. Sparks, D.L., S. Parikh, M. Borda, and B.J. Lafferty. 2006. Advances in the Use of Real-Time Molecular Scale Techniques to Explore Reaction Mechanisms at the Mineral/Water Interface. Invited Talk. A Symposium in Honor of Garrison Sposito. 232nd Am. Chemistry Society National Meeting, San Francisco, California, September 10-14.
 138. Sparks, D.L. 2007. The Role of X-ray Absorption Spectroscopy (XAS) in Advancing the Frontiers of Environmental Interfacial Chemistry. Invited Talk. ACIS 2007 Australian Colloid and Interface Symposium, Coogee

Beach, Sydney, Australia, February 4-8.

139. Sparks, D.L. 2007. The Role of Molecular Environmental Science in Elucidating Biogeochemical Processes in the Earth's Critical Zone. Old Dominion University, Norfolk, Virginia, March 2.
140. Sparks, D.L. 2007. Frontiers in Exploration of Biogeochemical Processes at Critical Zone Interfaces. Department of Plant and Soil Sciences, University of Kentucky, April 27.
141. Sparks, D.L. 2007. The Role of Molecular Environmental Science in Elucidating Biogeochemical Processes in the Earth's Critical Zone. Old Dominion University, Norfolk, Virginia, March 2.
142. Sparks, D.L., 2007. Frontiers in Exploration of Biogeochemical Interfaces in the Earth's Critical Zone. Geophysical Laboratory, Carnegie Institution of Washington, Washington, D.C., June 4.
143. Sparks, D.L., 2007. The Role of Molecular Environmental Science Tools in Exploring Metal Cycling in the Natural Environment. Zhejiang University, Hangzhou, China, July 12.
144. Sparks, D.L., 2007. The Role of Molecular Environmental Science in Advancing the Frontiers of Trace Element Biogeochemistry. 9th International Conference on the Biogeochemistry of Trace Elements (ICOBTE), Beijing, China, July 15-19.
145. Sparks, D.L., 2007. Frontiers in Exploration of Biogeochemical Interfaces in the Earth's Critical Zone. China Agricultural University, Beijing, China, July 17.
146. Sparks, D.L., 2007. The Future of Soil: Opportunities and Challenges. The 27th Congress of the Polish Society of Soil Science P 70 Years Jubilee, Warsaw, Poland, September 3-7.
147. Sparks, D.L., 2007. Frontiers in Exploration of Biogeochemical Processes in the Earth's Critical Zone: The Role of Scale and Interfaces. Department of Crop and Soil Environmental Sciences, Virginia Tech, Blacksburg, Virginia, October 12.
148. Sparks, D.L., 2008. The Role of XAFS in Addressing Grand Challenges and Opportunities in Environmental Science. XAS NSLS-II Workshop, Brookhaven National Laboratory, Upton, New York, January 16.
149. Sparks, D.L., 2008. The Role of Synchrotron Radiation in Addressing Grand Challenges and Opportunities in Environmental Science, J. Bennett Johnston, Sr. Center for Advanced Microstructures and Devices (CAMD), Baton Rouge, Louisiana, April 4.
150. Sparks, D.L., 2008. Frontiers in Exploration of Biogeochemical Processes in

The Earth's Critical Zone: The Role of Scale and Interfaces, Louisiana State University, Baton Rouge, Louisiana, April 4.

151. Sparks, D.L. 2008. Shining Light on Biogeochemical Processes in the Earth's Critical Zone. USDA Beltsville's Director Distinguished Lecturer, Beltsville, Maryland, June 11.
152. Sparks, D.L., S.J. Parikh, M. Ginder-Vogel and G. Landrot. 2008. Real-time Molecular Scale Redox Kinetics at the Mineral/Water Interface. 236th American Chemistry Society National Meeting, Philadelphia, Pennsylvania, August 17-21.
153. Sparks, D.L. 2008. Shining Light on Biogeochemical Processes in the Earth's Critical Zone, University of Florida, Gainesville, Florida, September 11-12.
154. Sparks, D.L. 2008. Exploring Frontiers in Kinetics and Mechanisms of Geochemical Processes at the Mineral/Water Interface. Keynote talk at Center for Environmental Kinetics Analysis "All Hands" 5th Annual Meeting. The Pennsylvania State University, University Park, Pennsylvania, October 22.
155. Sparks, D.L., S.J. Parikh, M. Ginder-Vogel and G. Landrot. 2008. Advances in Elucidating Reactivity and Speciation at the Mineral/water Interface: The Role of Analytical Techniques and Computational Modeling, Goldschmidt Conference 2008, Vancouver, Canada, July 13 - 18.
156. Zhu, M., M. Ginder-Vogel, S.J. Parikh and D.L. Sparks. 2009. pH Effects on the Structure of Biogenic Mn-oxides. 237th ACS National Meeting, Salt Lake City, Utah, March 22-26.
157. Sparks, D.L., M. Ginder-Vogel, B. J. Lafferty, and S.J. Parikh. 2009. A multi-scale investigation of the kinetics and mechanisms of As(III) oxidation on hydrous manganese oxide. 9th V.M. Goldschmidt Conference, Davos, Switzerland, June 21-26.
158. Ginder-Vogel, M., G. Landrot and D.L. Sparks. 2009. Quantification of rapid environmental redox processes using quick-scanning X-ray absorption spectroscopy (Q-XAS). 9th V.M. Goldschmidt Conference, Davos, Switzerland, June 21-26.
159. Sparks, D.L. 2009. Shining Light on Biogeochemical Processes in the Earth's Critical Zone: Probing the Atomic Scale. Lessons Learned from X-ray Applications to Environmental Science Workshop Forum. University of California, Davis, September 3. (Plenary Speaker).
160. Sparks, D.L. and M. Zhu. 2009. The Value of a Multi-Scale, Multi-Tool Approach in Elucidating Metal(loid) Biogeochemistry in the Environment. DFG-IUSS Symposium on Advances in Molecular Modeling of Biogeochemical Interfaces P Perspectives for Soil Research, Jena, Germany,

October 6-9. (Keynote speaker).

161. Sparks, D.L. 2009. Advances in the Use of Synchrotron Radiation in Elucidating Environmental Interfacial Reaction Processes and Mechanisms in the Earth's Critical Zone. Molecular Environmental Soil Science at Biogeochemical Interfaces in the Earth's Critical Zone Symposium, Zhejiang University, Hangzhou, China, October 10-14. (Plenary Speaker).
162. Ginder-Vogel, M. and D.L. Sparks. 2010. Real-time Characterization of Heterogeneous As(III) Oxidation by Hydrous Manganese(IV) Oxide using Quick-scanning X-ray Absorption Spectroscopy (Q-XAS). 239th ACS National Meeting, San Francisco, California, March 21-25.
163. Siebecker, M. and D.L. Sparks. 2010. Nickel Speciation in Serpentine Soils using Synchrotron Radiation Techniques. 19th World Congress of Soil Science: Soil Solutions for a Changing World. Brisbane, Australia, August 1-6.
164. Sparks, D.L., M. Ginder-Vogel and G. Landrot. 2010. In situ Characterization of Environmental Redox Reactions using Quick-scanning X-ray Absorption Spectroscopy (Q-XAS). 239th ACS National Meeting, San Francisco, California, March 21-25.
165. Sparks, D.L. 2010. Integrating Spectroscopic, Kinetic, and Modeling Approaches to Elucidating the Mechanisms of Contaminant Interactions in Heterogeneous Natural Systems. 93rd Canadian Chemistry Conference and Exhibition, Toronto, Ontario, Canada, May 29-June 2.
166. Sparks, D.L. 2010. Shining Light on Biogeochemical Processes at Soil Interfaces. Saskatoon 2010: Transfers and Transformations, Joint Conference of the CSSA & CSA, Saskatoon, Saskatchewan, Canada, June 20-24.
167. Sparks, D.L. 2010. A New Model for Training Soil Science Students to Compete in a Global Society. 19th World Congress of Soil Science: Soil Solutions for a Changing World. Brisbane, Australia, August 1-6
168. Sparks, D.L. 2010. The Role of Advanced Analytical Techniques in Elucidating Phosphorus Dynamics in the Environment, 4th International Symposium on Phosphorus Dynamics in the Soil-Plant Continuum (ISPDSPC), Beijing, China, September 19-23.
169. Sparks, D.L. 2010. Integrating Spectroscopic, Kinetic, and Modeling Approaches to Elucidate the Mechanisms of Contaminant Interactions in Heterogeneous Natural Systems, Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, Beijing, China, September 24.
170. Sparks, D.L. 2010. The Use of Q-XAS and ATR-FTIR Techniques to Elucidate Reaction Mechanisms at Biogeochemical Interfaces in Soil,

Advanced Spectroscopic and Microscopic Characterization Techniques -
Tools To Enlighten Biogeochemical Interfaces in Soil, Jena, Germany,
October 4-5

171. Sparks, D.L. 2010. Time-resolved Metal(loid) Reactivity at Biogeochemical Interfaces, Institute of Biogeochemistry and Pollutant Dynamics, Department of Environmental Sciences, ETH Zurich, Switzerland, October 7.
172. Sparks, D.L. 2011. Analytical Approaches for Investigating Reaction Mechanisms at Carbon/Mineral and Metal(loid)/Mineral Interfaces. 6th ISMOM, International Symposium of Interactions of Soil Minerals with Organic Components and Microorganisms, 3rd InterCongress of Commission 2.5 IUSS Soil Chemical, Physical and Biological Interfacial Reactions. Montpellier, France, June 26 - July 1.
173. Sparks, D.L., 2011. A Multi-Scale Assessment of the Kinetics and Mechanisms of As(III) Oxidation on Hydrous Manganese Oxide, ICOTBE 2011, 11th International Conference on the Biogeochemistry of Trace Elements, Florence, Italy July 3-7.
174. Sparks, D.L , M. Ginder-Vogel and G. Landrot. 2011. Time-resolved metal(loid) reactivity at biogeochemical interfaces. Goldschmidt 2011 Conference, Prague, Czech Republic, August 14-19. p. 1920.
175. Sparks, D.L. 2011. Shining Light on Biogeochemical Processes in the Rhizosphere. Post-Symposium Workshop on Advances in Rhizosphere Science. Department of Plant and Soil Sciences, University of Delaware, Newark, Delaware. August 25.
176. Sparks, D.L. 2011. Shining Light on Biogeochemical Processes. Institute of Soil Science, Chinese Academy of Sciences, Nanjing, China. September 12.
177. Sparks, D.L. 2011. The Critical Role of Soil Science in Addressing Global Environmental Challenges. Einstein Professor Lecture, Institute of Soil Science. Chinese Academy of Sciences. Nanjing, China September 13.
178. Sparks, D.L. 2011. The Pathways and Processes Utilized to Develop the Critical Zone Observatories. Institute of Soil Science, Chinese Academy of Sciences, Nanjing, China. September 14.
179. Sparks, D.L. 2011. The Critical Role of Soil Science in Addressing Global Environmental Challenges. Institute of Applied Ecology, Chinese Academy of Sciences, Shenyang, China. September 15.
180. Sparks, D.L. 2011. The Critical Role of Environmental Science/Engineering in Addressing Global Challenges. Institute of Urban Environment, Chinese Academy of Sciences. Xiamen, China. September 20.
181. Zhu, M. and D. L. Sparks. 2012. Interactions between Cations and

Nanoparticulate Layered Mn Oxides - A x-ray Atomic Pair Distribution Functions (PDF) Analysis. Spring 2012 American Chemical Society National Meeting, San Diego, California, March 25-29.

182. Lazareva, O., D.L. Sparks, A. Aufdenkamp, J. Kan, S. Hicks, J. LeMonte, W. Pan and C. Chen. 2012. Biogeochemical Transformation of Fe- and Mn- Along a Redox Gradient: Implications for Carbon Sequestration Within the Christina River Basin Critical Zone Observatory. Spring 2012 American Chemical Society National Meeting, San Diego, California. March 25-29.
183. Sparks, D. L., 2012. Frontiers in Soil and Environmental Chemistry: The Important Role of Synchrotron-Based Tools. 15th Annual Users' Meeting, Canadian Light Source, Saskatoon, Saskatchewan, Canada. May 3-4.
184. Sparks, D.L., C. Chen, O. Lazareva, J. Lemonte, J.J. Dynes, J. Wang, and T. Regier. 2012. The Role of Metal Redox Coupling Processes in Carbon Cycling and Stabilization, The 22nd V. M. Goldschmidt Conference, Montreal, Canada, June 24-29
185. Sparks, D.L. 2012. Grand Challenges in Soil and Environmental Sustainability: The Importance of Basic Biogeochemical Research. EUROSIL 2012, 4th International Congress of ECSSS, Bari, Italy, July 2.
185. Sparks, D. L. 2012. Factors Impacting Carbon-Mineral Complexation Mechanisms in the Christiana River Basin Critical Zone Observatory, Stanford University, Stanford, California, August 23.
186. Sparks, D. L. 2012. Grand Challenges in Environmental Sustainability: The Importance of Basic Biogeochemical Research. Huazhong Agricultural University, Wuhan, China, September 3.
187. Sparks, D. L. 2012. Carbon-Metal mineral Complexation and Cycling in the Christina River Basin Critical Zone Observatory. 2nd International Conference on Geobiology, "Critical Zone Observatories for Sustainable Soil Development and Beyond", Huazhong Agricultural University, Wuhan, China, September 3.
188. Sparks, D. L. 2012. The Role of Metal Redox Coupling Processes in Carbon and Arsenic Cycling in the Critical Zone Observatories for Sustainable Soil Development and Beyond", Huazhong Agricultural University, Wuhan, China, September 4.
189. Sparks, D. L. 2012. The Role of Mineral Complexation and Metal Redox Coupling in Carbon Cycling and Stabilization, 16th Meeting of the International Humic Substances Society, Zhejiang University, Hangzhou, China, September 9-14.
190. Sparks, D. L. 2012. The Role of Critical Zone Science in Promoting Environmental and Agricultural Sustainability. SSSA International Annual Meeting, Cincinnati, Ohio, October 21-24.

191. Sparks, D. L. 2012. The Role of a Multi-Scale and Multi-Tool Approach in Advancing the Frontiers of Soil Biogeochemistry. SSSA International Annual Meeting, Cincinnati, Ohio, October 21-24.
192. Sparks, D. L. 2012. Grand Challenges in Environmental Sustainability: The Water, Climate, Soil and Food Nexus. University of Western Australia, Perth, Australia, November 12.
193. Sparks, D. L. 2012. Grand Challenges in Environmental Sustainability: The Water, Climate, Soil and Food Nexus. University of South Australia, Adelaide, Australia, November 14.
194. Sparks, D. L. 2012. Grand Challenges in Environmental Sustainability: The Water, Climate, Soil and Food Nexus. University of Queensland, Brisbane, Australia, November 16.
195. Sparks, D. L. 2012. Grand Challenges in Environmental Sustainability: The Water, Climate, Soil and Food Nexus. University of Western Sydney, Sydney, Australia, November 19.
196. Sparks, D.L. 2013. The Role of Metal Redox Coupling Processes in Carbon and Arsenic Cycling in the Critical Zone. Department of Soil Science, Kasetsart University, Bangkok, Thailand. March 26.
197. Sparks, D.L. 2013. Grand Challenges in Environmental Sustainability: The Water, Climate, Soil, and Food Nexus. Faculty of Agriculture, Kasetsart University, Bangkok, Thailand. March 28.
198. Sparks, D.L. 2013. Surface Precipitation Mechanisms and their role in Metal Sequestration in Natural Environments. 245th American Chemical Society National Meeting and Exposition, New Orleans, Louisiana. April 7-11.
197. Sparks, D.L. 2013. Shining Light on Environmental Biogeochemical Processes: The Role of Synchrotron Radiation. Institute of Soil Science, Nanjing, China. April 20.
198. Sparks, D.L. 2013. Soil and Environmental Sustainability: Research Challenges and Opportunities. Nanjing Agricultural University, Nanjing, China. April 22.
199. Sparks, D.L. 2013. The Role of Mineral Complexation and Redox Cycling on Carbon Sequestration in the Earth's Critical Zone. Critical Zone Processes and Their Effects on Climatic, Ecological, and Environmental Changes Workshop, Nanjing, China. April 23-25.
200. Sparks, D.L. 2013. Grand Challenges in Environmental Sustainability: The Water, Climate, Soil, and Food Nexus. Northwest Agriculture University, Yangling, China. April 26.

201. Sparks, D.L. and C. Chen. 2013. Shedding Light on Carbon-mineral Complexation in the Soil Environment: Impacts on C Sequestration and Cycling. International Union of Soil Sciences, Madison, Wisconsin. June 3-6.
202. Sparks, D.L. 2013. C-mineral complexation and its role on C cycling and sequestration. XXXIV Brazilian Congress of Soil Sciences, Florianopolis, Brazil, July 28-August 2.
203. Sparks, D.L. 2013. Grand Challenges and Opportunities in Soil Chemistry in the 21st Century. XXXIV Brazilian Congress of Soil Sciences, Florianopolis, Brazil, July 28-August 2.
204. Sparks, D.L. 2013. Shining Light on Soil Biogeochemical Processes: Opportunities and Challenges in the 21st Century, German Soil Science Society Meeting, Rostock, Germany, September 7-12.
205. Sparks, D.L. 2013. Grand Challenges in Environmental Sustainability: The Water, Climate, Soil, and Food Nexus. The Weston Roundtable Distinguished Lecturer, University of Wisconsin-Madison, Madison, Wisconsin, October 23-25.
206. Sparks, D.L. 2013. The Role of Mineral Complexation and Metal Redox Coupling in Carbon Cycling and Stabilization. University of Wisconsin-Madison, Madison, Wisconsin, October 23-25.
207. Sparks, D.L. 2013. Grand Challenges and Opportunities in Environmental Sustainability: The Soil, Water, Climate, and Food Nexus, University of Massachusetts, Amherst, MA Stockbridge School of Agriculture, November 18.
208. Sparks, D.L. 2014. Grand Challenges in Environmental Sustainability: The Soil, Water, Climate, and Food Nexus, University of Wuppertal, Wuppertal, Germany, January 9.
209. Sparks, D. L. 2014. Advances in the Use of Synchrotron-Based Techniques to Elucidate Biogeochemical Processes in Natural Systems. Applications of Synchrotron Radiation for Environmental and Earth Sciences. Brazilian Synchrotron Light Source, Campinas, Brazil, March 13-14.
210. Sparks, D.L., B. Lafferty, M. Ginder-Vogel, G. Landrot, M. Zhu, J. Fischel, M. Fischel. 2014. Multiscale Assessment of the Kinetics and Mechanisms of Metal-(loid) Oxidation at the Mn-oxide/Water Interface. 247th American Chemical Society National Meeting and Exposition, Dallas, Texas, March 16-20.
211. Sparks, D.L. 2014. The Role of Mineral Complexation and Metal Redox Coupling in Carbon Cycling and Stabilization, Miami University, Department of Geology Seminar Series, Oxford, Ohio, April 4.
- 212.

F. Abstracts from Papers Presented at International, National and Regional Meetings:

1. Sparks, D.L., and H.H. Bailey. 1976. Distribution of fixed ammonium in 3 Typic Hapludalf profiles in Kentucky. Agron. Abstr. p. 167. American Society of Agronomy Meetings, Houston, Texas.
2. Sparks, D.L., L.W. Zelazny, and D.C. Martens. 1978. Potassium status of a Paleudult from the Virginia Coastal Plain. Abstr. of Southern Assoc. of Agricult. Scient. p. 4, New Orleans, Louisiana.
3. Sparks, D.L., L.W. Zelazny, and D.C. Martens. 1978. Kinetics of potassium exchange in a Paleudult from the Coastal Plain of Virginia. Agron. Abstr. p. 137, American Society of Agronomy Meetings, Chicago, Illinois.
4. Sparks, D.L., L.W. Zelazny, and D.C. Martens. 1979. Potassium desorption kinetics using miscible displacement. Agron. Abstr. p. 153, American Society of Agronomy Meetings, Fort Collins, Colorado.
5. Sparks, D.L., W.F. Kitchel, W.J. Edmonds, and D.C. Martens. 1979. Ion movement in sandy Coastal Plain soils as it affects soil test interpretations. Agron. Abstr. p. 174, American Society of Agronomy Meetings, Fort Collins, Colorado.
6. Sparks, D.L., and W.G. Pill. 1980. Pasteurization and nitrapyrin effects on soil nutrition and tomato growth. Abstr. of Northeastern Branch of American Soc. of Agron. p. 3, State College, Pennsylvania.
7. Sparks, D.L. 1980. Kinetics and thermodynamics of potassium exchange in pure and in mixed systems. Agron. Abstr. p. 145, American Society of Agronomy Meetings, Detroit, Michigan.
8. Sparks, D.L., and P.M. Jardine. 1980. Thermodynamics of potassium exchange in Delaware soils. Agron. Abstr. p. 145, American Society of Agronomy Meetings, Detroit, Michigan.
9. Sparks, D.L., and W.C. Liebhardt. 1980. Effect of long-term lime and potassium applications on Q/I relationships in sandy soil. Agron. Abstr. p. 145, American Society of Agronomy Meetings, Detroit, Michigan.
10. Sparks, D.L., and W.H. Mitchell. 1980. Effect of tillage and irrigation practices and waste amendments on selected chemical properties of a Delaware soil. Agron. Abstr. p. 32, American Society of Agronomy Meetings, Detroit, Michigan.
11. Sparks, D.L., and J.E. Rechcigl. 1981. Comparison of batch and miscible displacement techniques to describe potassium adsorption kinetics in Delaware soils. Northeastern Branch of American Soc. of Agron., Orono, Maine.

12. Rechcigl, J.E., M.R. Teel, and D.L. Sparks. 1981. Effect of nitrapyrin and nitrogen source on NH_4^{+} -N fixation in a Matapeake soil. Northeastern Branch of American Soc. of Agron., Orono, Maine.
13. Sparks, D.L. 1982. Ion activities: An historical and theoretical overview. Agron. Abstr., American Society of Agronomy Meetings, Anaheim, California.
14. Jardine, P.M., and D.L. Sparks. 1982. Potassium-calcium exchange in a multireactive soil system: I. Kinetics. Agron. Abstr. p. 175, American Society of Agronomy Meetings, Anaheim, California.
15. Sparks, D.L., and P.M. Jardine. 1982. Potassium-calcium exchange in a multireactive soil system: II. Thermodynamics. Agron. Abstr. p. 180, American Society of Agronomy Meetings, Anaheim, California.
16. Martin, H.W., and D.L. Sparks. 1982. The kinetics of non-exchangeable potassium release in Coastal Plain soils. Agron. Abstr. p. 177, American Society of Agronomy Meetings, Anaheim, California.
17. Evans, C.M., and D.L. Sparks. 1983. Kinetics and mechanisms of boron sorption and desorption in Mid-Atlantic Coastal Plain soils. Agron. Abstr., American Society of Agronomy Meetings, Washington, D.C.
18. Teel, M.R., D.L. Sparks, E. Dunlop, and R. Turnbull. 1983. Infrared aerial photography: A tool for identifying soil texture boundaries. Agron. Abstr., American Society of Agronomy Meetings, Washington, D.C.
19. Teel, M.R., D.E. Baker, and D.L. Sparks. 1983. Correlation of soybean yields with cation ratios expressed as activities versus exchangeable indices. Agron. Abstr. Northeastern Branch-American Society of Agronomy, Baltimore, Maryland.
20. Sparks, D.L., and T.H. Carski. 1984. Kinetics of potassium exchange in heterogeneous systems. International Clay Minerals Symposium, Calgary, Canada.
21. Ogwada, R.A., and D.L. Sparks. 1984. Comparison of kinetic equations to describe kinetics of potassium exchange in soils. Canadian Society of Soil Science, Banff, Canada.
22. Ogwada, R.A., and D.L. Sparks. 1984. Comparison of equilibrium and kinetic approaches to describe K-Ca exchange in soils. Agron. Abstr. p. 179, American Society of Agronomy Meetings, Las Vegas, Nevada.
23. Carski, T.H., and D.L. Sparks. 1984. A modified miscible displacement technique to study adsorption-desorption phenomena in soils. Agron. Abstr. p. 176, American Society of Agronomy Meetings, Las Vegas, Nevada.

24. Ogwada, R.A., and D.L. Sparks. 1985. Quantification of rate- limiting steps in ion adsorption processes in soils and clay minerals. Agron. Abstr. p. 150, American Society of Agronomy Meetings, Chicago, Illinois.
25. Sparks, D.L., and R.A. Ogwada. 1985. Use of mole or equivalent fractions in determining thermodynamic parameters for potassium exchange in soils. Agron. Abstr. p. 151, American Society of Agronomy Meetings, Chicago, Illinois.
26. Schulthess, C.P., and D.L. Sparks. 1985. Modeling of proton sorption on oxide and clay mineral surfaces. Agron. Abstr. p. 151, American Society of Agronomy Meetings, Chicago, Illinois.
27. Hendricks, G.J., D.L. Sparks, and D.R. Parker. 1985. Effect of timing of potassium applications on leaching and corn yields in Delaware soils in an intensive management system. Agron. Abstr. p. 25, American Society of Agronomy Meetings, Chicago, Illinois.
28. Alvarez, R.A., and D.L. Sparks. 1985. Anion polymerization and sorption on sesquioxides. Agron. Abstr. p. 144, American Society of Agronomy Meetings, Chicago, Illinois.
29. Mirecki, J., M.R. Noll, and D.L. Sparks. 1985. Sand mineralogy of Delaware Coastal Plain soils: Its role in supplying potassium. Agron. Abstr. p. 232, American Society of Agronomy Meetings, Chicago, Illinois.
30. Carski, T.H., and D.L. Sparks. 1985. Chemical determination of nitrogen availability using a kinetic approach. Agron. Abstr. p. 146, American Society of Agronomy Meetings, Chicago, Illinois.
31. Noll, M.R., D.L. Sparks, and P.M. Bertsch. 1985. Effects of temperature on K-NH₄, K-Cs, and NH₄-Cs exchange selectivity on selected clay minerals. Agron. Abstr. p. 150, American Society of Agronomy Meetings, Chicago, Illinois.
32. Sparks, D.L. 1986. Kinetics of ion exchange on soil constituents: An overview. Northeastern Branch of American Soc. Agronomy Meetings, Newark, Delaware.
33. Sadusky, M.C., D.L. Sparks, and M.R. Noll. 1986. Mechanisms of potassium feldspar weathering in Delaware soils. Northeastern Branch of American Society of Agronomy Meetings, Newark, Delaware.
34. Hendricks, G.J., and D.L. Sparks. 1986. The remarkable behavior of potassium on Atlantic Coastal Plain soils. Northeastern Branch of American Society of Agronomy Meetings, Newark, Delaware.
35. Carski, T.H., D.L. Sparks, and C.V. Toner, IV. 1986. Anion exchange and nitrate retention on Mid-Atlantic soils. Northeastern Branch of American Society of Agronomy Meetings, Newark, Delaware.

36. Carski, T.H., and D.L. Sparks. 1986. Kinetics of nitrate retention on Mid-Atlantic soils. American Society of Agronomy Meetings, New Orleans, Louisiana.
37. Toner, C.V., IV, T.H. Carski, and D.L. Sparks. 1986. Nitrate retention on variable charged soils of the Mid-Atlantic Region. American Society of Agronomy Meetings, New Orleans, Louisiana.
38. Sparks, D.L. 1986. Kinetics of soil chemical processes. American Society of Agronomy Meetings, New Orleans, Louisiana.
39. Sparks, D.L., and G.J. Hendricks. 1986. Boron status of Delaware soils. American Society of Agronomy Meetings, New Orleans, Louisiana.
40. Schulthess, C.P., and D.L. Sparks. 1986. Na^+/Cl^- and H^+/OH^- speciation behavior on an Al-oxide surface. American Society of Agronomy Meetings, New Orleans, Louisiana.
41. Sadusky, M.C., and D.L. Sparks. 1986. Anionic effects on the kinetics of potassium adsorption on soil constituents. American Society of Agronomy Meetings, New Orleans, Louisiana.
42. Noll, M.R., D.L. Sparks, and P.M. Bertsch. 1986. Kinetics of Cs-K and NH_4 -Cs exchange on clay minerals and sediments. American Society of Agronomy Meetings, New Orleans, Louisiana.
43. Schulthess, C.P., and D.L. Sparks. 1987. Charge speciation modeling of oxide surfaces. Colloid and Surface Science Symposium, Ann Arbor, Michigan, June 21-24.
44. Noll, M.R., P.M. Bertsch, and D.L. Sparks. 1987. Cesium exchange kinetics on illite. Clay Minerals Society Meeting, Socorro, New Mexico.
45. Pasricha, N.S., D.L. Sparks, and C.V. Toner, IV. 1987. Competitive anion adsorption kinetics on variable charge soils. American Society of Agronomy Meetings, Atlanta, Georgia.
46. Sparks, D.L., and C.P. Schulthess. 1988. Modeling chemical sorption in soils and soil constituents. Soil Science Soc. Am. Meetings, Anaheim, California.
47. Hendricks, G.J., and D.L. Sparks. 1988. Role of organic matter in boron availability. Soil Science Soc. Am. Meetings, Anaheim, California.
48. Grant, S.A., and D.L. Sparks. 1988. Evaluation of activity coefficient models for exchangeable cations. Soil Sci. Soc. Am. Meetings, Anaheim, California.
49. Zhang, P., and D.L. Sparks. 1988. Molybdate adsorption/ desorption kinetics at the goethite/water interface using pressure-jump relaxation. Soil Science Soc. Am. Meetings, Anaheim, California.

50. Toner, C.V., IV, and D.L. Sparks. 1988. Use of chemical relaxation to study mechanisms of borate adsorption-desorption on gamma-aluminum oxide. Soil Science Soc. Am. Meetings, Anaheim, California.
51. Seyfried, M.S., D.L. Sparks, A. Bar-Tal, and S. Feigenbaum. 1988. Kinetics of Ca-Mg exchange on soil using a stirred-flow reaction chamber. Soil Science Soc. Am. Meetings, Anaheim, California.
52. Zhang, Z.Z., D.L. Sparks, and R.A. Pease. 1988. Sorption and desorption of organics on smectite. Soil Science Soc. Am. Meetings, Anaheim, California.
53. Aharoni, C., and D.L. Sparks. 1989. Application of chemical kinetics to heterogeneous soil systems. Soil Sci. Soc. Am. Meetings, Las Vegas, Nevada.
54. Bar-Tal, A., D.L. Sparks, J.D. Pesek, S. Feigenbaum, and M. Eick. 1989. Analysis of adsorption kinetics determined by a stirred-flow technique: I. Theory and experimental tests. Soil Sci. Soc. Am. Meetings, Las Vegas, Nevada.
55. Bar-Tal, A., M. Eick, D.L. Sparks, and S. Feigenbaum. 1989. Analysis of adsorption kinetics determined by a stirred-flow technique: II. K-Ca exchange on vermiculite and montmorillonite. Soil Sci. Soc. Am. Meetings, Las Vegas, Nevada.
56. Sparks, D.L., and P. Zhang. 1989. Relaxation methods for studying kinetics of soil chemical phenomena. Soil Sci. Soc. Am. Meetings, Las Vegas, Nevada.
57. Zhang, P.C., and D.L. Sparks. 1989. Kinetics and mechanisms of sulfate adsorption/desorption on goethite using pressure-jump relaxation. Soil Sci. Soc. Am. Meetings, Las Vegas, Nevada.
58. Sparks, D.L., and P.C. Zhang. 1990. Interaction of phenol and aniline with montmorillonite and illite. Soil Sci. Soc. Am. Meetings, San Antonio, Texas.
59. Zhang, P.C., and D.L. Sparks. 1990. Kinetics of adsorption of selenate and selenite at the goethite/water interface. Soil Sci. Soc. Am. Meetings, San Antonio, Texas.
60. Stapleton, M.G., and D.L. Sparks. 1990. Sorption kinetics of organic pollutants on clay minerals. Soil Sci. Soc. Am. Meetings, San Antonio, Texas.
61. Hendricks, G.J., Z.Z. Zhang, and D.L. Sparks. 1990. On the electric properties of the oxide-water interface. Soil Sci. Soc. Am. Meetings, San Antonio, Texas.
62. Zhang, Z.Z., D.L. Sparks, and N. Scrivner. 1990. Effect of dispersion of montmorillonite on the sorption of organics. Soil Sci. Soc. Am. Meetings, San Antonio, Texas.

63. Aharoni, C., L. Tang, and D.L. Sparks. 1990. Kinetics of cation exchange on clay minerals using pressure-jump relaxation. Soil Sci. Soc. Am. Meetings, San Antonio, Texas.
64. Toner, C.V., IV, and D.L. Sparks. 1990. Mechanisms of boron adsorption on metal oxides. Soil Sci. Soc. Am. Meetings, San Antonio, Texas.
65. Zhang, P.C., and D.L. Sparks. 1990. Kinetics and mechanisms of anion sorption on oxides using pressure-jump relaxation. International Soil Sci. Congress, Kyoto, Japan.
66. Sparks, D.L. and P. Zhang. 1990. Kinetics of anion adsorption/desorption on soil constituents using pressure-jump relaxation. Proc. of 14th International Soil Science Congress, Kyoto, Japan. II-293-II-294.
67. Zhang, Z.Z., and D.L. Sparks. 1990. Sorption mechanisms of organic pollutants on clays. Society of Environmental Toxicology and Chemistry meeting, Arlington, VA, November, 1990.
68. Fendorf, S.E., and D.L. Sparks. 1991. Chromium (III) induced solid phase transformation of MnO₂. Clay Minerals Society Meeting, Houston, Texas, October, 1991.
69. Zhang, Z.Z., and D.L. Sparks. 1991. Sorption and desorption of quaternary amine cations on clays. Clay Minerals Society meeting, Houston, Texas, October, 1991.
70. Fendorf, S.E., and D.L. Sparks. 1991. Surface precipitation of hydrolyzable metal ions on oxide surfaces. Soil Sci. Soc. Am. meetings, Denver, Colorado. Agron. Abstr. p. 243.
71. Zhang, P.C., and D.L. Sparks. 1991. Kinetics of phenol and aniline adsorption and desorption on an organo-clay (HDTMA-montmorillonite). Soil Sci. Soc. Am. meetings, Denver, Colorado. Agron. Abstr. p. 255.
72. Lee, J., B. Chen, H.E. Allen, C.P. Huang, D.L. Sparks, and P. Sanders. 1991. Development of soil criteria to protect groundwater quality. Society for Environmental Toxicology and Chemistry. Seattle, Washington. November, 1991.
73. Zhang, Z.Z., D.L. Sparks, and N.C. Scrivner. 1991. Retention of acetonitrile and acrylonitrile on clays. American Geophysical Union 1991 Spring meeting, Baltimore, Maryland, 1991.
74. Zhang, Z.Z., and D.L. Sparks. 1992. Retention of acetonitrile and acrylonitrile on clays. Underground injection practices council, Corpus Christi, Texas, January, 1992.

75. Fendorf, S.E., and D.L. Sparks. 1992. Kinetics of Mn(II) sorption/desorption reactions on manganese oxides. Goldschmidt Conference, Geochemical Society meeting, ACS, Reston, Virginia, May, 1992.
76. Fendorf, S.E., and D.L. Sparks. 1992. Reductive dissolution kinetics of manganese oxide by Cr(III). ACS Meetings, San Francisco, California, March, 1992.
77. Grossl, P.R., D.L. Sparks, and C. Ainsworth. 1992. Kinetics of Cu(II) adsorption/desorption on alpha-ferric hydroxide using a pressure-jump relaxation technique. Soil Sci. Soc. Am. Meeting, Minneapolis, Minnesota.
78. Fendorf, S.E., D.L. Sparks, M. Fendorf, and R. Gronsky. 1992. Heavy metal sorption effects on the surface structure of metal oxides. ACS Meetings, San Francisco, California.
79. Salingar, Y., G.J. Hendricks, D.L. Sparks, and J.D. Pesek. 1992. Modeling the kinetics of salt removal from an iron-rich industrial coproduct. Soil Sci. Soc. Am. Meeting, Minneapolis, Minnesota, October, 1992.
80. Chang, J.R., D.L. Sparks, G.N. Lamble, and M.J. Kelley. 1992. Lead-contaminated whole soils: XANES and EXAFS Studies. Soil Sci. Soc. Am. Meeting, Minneapolis, Minnesota, October, 1992.
81. Stapleton, M.G., D.L. Sparks, and S.K. Dentel. 1992. Sorption of pentachlorophenol to a surfactant modified montmorillonite. Soil Sci. Soc. Am. Meeting, Minneapolis, Minnesota, October, 1992.
82. Fendorf, S.E., and D.L. Sparks. 1992. Electron paramagnetic resonance (EPR) spectroscopically monitored stopped-flow kinetics. Soil Sci. Soc. Am. Meeting, Minneapolis, Minnesota, October, 1992.
83. Fendorf, S.E., M.G. Stapleton, G. Lamble, M.J. Kelley, and D.L. Sparks. 1992. The complexation structure of Cr(III) on silicon dioxide: An x-ray absorption spectroscopic analysis. Soil Sci. Soc. Am. Meeting, Minneapolis, Minnesota, October, 1992.
84. Hendricks, G.J., Y. Salingar, and D.L. Sparks. 1992. Kinetics of chloride removal from an iron-rich industrial coproduct. Soil Sci. Soc. Am. Meeting, Minneapolis, Minnesota, October, 1992.
85. Zhang, Z.Z., D.L. Sparks, and N.C. Scrivner. 1992. Long-term desorption of quaternary amine cations from clays. Soil Sci. Soc. Am. Meeting, Minneapolis, Minnesota, October, 1992.
86. Ball, M.A., T.H. Carski, M.J. Duffy, and D.L. Sparks. 1993. A continuous flow technique for measuring sorption-desorption kinetics of herbicides on soils. Soil Sci. Soc. Am. Meeting, Cincinnati, Ohio, November, 1993.
87. Grossl, P.R., D.L. Sparks, and C.C. Ainsworth. 1993. Kinetics of arsenate

- adsorption/desorption on goethite. Soil Sci. Soc. Am. Meeting, Cincinnati, Ohio, November, 1993.
88. Keren, R., and D.L. Sparks. 1993. Charge properties of edge surfaces of 2:1 clay and their role in ion adsorption and flocculation. Soil Sci. Soc. Am. Meeting, Cincinnati, Ohio, November, 1993.
 89. Stapleton, M.G., and D.L. Sparks. 1993. Sorption kinetics of pentachlorophenol on hexadecyltrimethylammonium clay. Soil Sci. Soc. Am. Meeting, Cincinnati, Ohio, November, 1993.
 90. Tang, L., and D.L. Sparks. 1993. Adsorption-desorption kinetics of atrazine on soil constituents. Soil Sci. Soc. Am. Meeting, Cincinnati, Ohio, November, 1993.
 91. Zhang, Z.Z., D.L. Sparks, and G.N. Lamble. 1993. Effect of anions on copper-sodium exchange selectivity on montmorillonite. Soil Sci. Soc. Am. Meeting, Cincinnati, Ohio, November, 1993.
 92. Tang, L., and D.L. Sparks. 1994. Adsorption-desorption kinetics of atrazine on vermiculite using a stirred-flow technique. SSSA Meeting, Seattle, Washington.
 93. Scheidegger, A.M., D.L. Sparks, M. Fendorf, and G.M. Lamble. 1994. Mechanisms of nickel adsorption on pyrophyllite. SSSA Meeting, Seattle, Washington.
 94. Grossl, P.R., M.J. Eick, D.L. Sparks, and C.C. Ainsworth. 1994. Kinetics of oxyanion adsorption/desorption on goethite: A pressure-jump relaxation study, SSSA Meeting, Seattle, Washington.
 95. Sparks, D.L., Z.Z. Zhang, and J. Wu. 1995. Mechanisms of adsorption/desorption reactions of humic acid with aluminum oxides. Clay Minerals Society Meeting, June 3-8, Baltimore, Maryland.
 96. Sparks, D.L., and J.P. DiVincenzo. 1995. Residence time and pH effects on pentachlorophenol sorption on soil. Clay Minerals Society Meeting, June 3-8, Baltimore, Maryland.
 97. Sparks, D.L., and A.M. Brennan. 1995. Aging effects on the kinetics of cesium desorption from vermiculite and contaminated soil. Soil Sci. Soc. Am. Meeting, St. Louis, Missouri.
 98. Sparks, D.L., and J.P. DiVincenzo. 1995. Sorption-desorption of pentachlorophenol on soil: residence time and pH effects. Soil Sci. Soc. Am. Meeting, St. Louis, Missouri.
 99. Sparks, D.L., and G.M. Lamble. 1995. Investigation of Ni adsorption on pyrophyllite: An XAFS study. Soil Sci. Soc. Am. Meeting, St. Louis, Missouri.

100. Sparks, D.L., D.R. Ware, M.J. Duffy and T.H. Carski. 1995. The aqueous hydrolysis of tribenuron methyl: Implications for fate in soils. Soil Sci. Soc. Am. Meeting, St. Louis, Missouri.
101. Sparks, D.L., and A.M. Scheidegger. 1995. Formation and dissolution kinetics of heavy metal surface precipitates. Soil Sci. Soc. Am. Meeting, St. Louis, Missouri.
102. Sparks, D.L., T.E. Alcacio, G.M. Lamble, and A.M. Scheidegger. 1995. Speciation of lead in mixed soil component systems using extended x-ray absorption fine structure spectroscopy. Soil Sci. Soc. Am. Meeting, St. Louis, Missouri.
103. Kleikemper, J., A.M. Scheidegger, D.L. Sparks, and J.C.L. Meeussen. 1996. Multicomponent adsorption and transport behavior of acidity and anions in a goethite/silica sand system. American Chemical Society National Meeting, New Orleans, Louisiana, March 1996.
104. Scheidegger, A.M., G.M. Lamble, M. Fendorf, and D.L. Sparks. 1996. Formation and dissolution of mixed Ni-Al hydroxide precipitates on pyrophyllite: Surface spectroscopic and microscopic studies. 70th Colloid and Surface Science Symposium, Division of Colloid and Surface Chemistry, American Chemical Society, Potsdam, New York, June 1996.
105. Alcacio, T.E., G.M. Lamble, A.M. Scheidegger, and D.L. Sparks. 1996. Lead competition in clay-oxide mixed systems: An XAFS analysis. Clay Minerals Society Annual Meeting, Gatlinburg, Tennessee, June 1996.
106. DiVincenzo, J.P., and D.L. Sparks. 1996. Slow sorption kinetics of pentachlorophenol on soils. Clay Minerals Society Meeting, Gatlinburg, Tennessee, June, 1996.
107. Scheidegger, A.M., G.M. Lamble, and D.L. Sparks. 1996. Effect of residence time on Ni-sorption mechanisms on clay and oxide minerals: An X-ray absorption fine structure (XAFS) study. Soil Sci. Soc. Am. Meeting, Indianapolis, Indiana, November, 1996.
108. Scheckel, K.G., A.M. Scheidegger, and D.L. Sparks. 1996. Use of atomic force microscopy (AFM) in assessing polynuclear Ni surface complexation on clay minerals. Soil Sci. Soc. Am. Meeting, Indianapolis, Indiana, November, 1996.
109. Brennan, A.M., and D.L. Sparks. 1996. Aging effects on the kinetics of cesium desorption from vermiculite and contaminated soil. Soil Sci. Soc. Am. Meeting, Indianapolis, Indiana, November, 1996.
110. Strawn, D.G., J.C. McCarthy, and D.L. Sparks. 1996. Residence time effects on metal sorption reversibility on soil. Soil Sci. Soc. Am. Meeting, Indianapolis, Indiana, November 1996.

111. Zhou, M., R.K. Trubey, T.M. Priester, and T.H. Carski. 1996. Sorption/desorption kinetics and equilibria of atrazine, diuron and bensulfuron methyl on selected soils. Soil Sci. Soc. Am. Meeting, Indianapolis, Indiana, November, 1996.
112. Alcacio, T.E., G.M. Lamble, and D.L. Sparks. 1996. Lead speciation in single and mixed mineral systems using X-ray absorption fine structure spectroscopy (XAFS). Soil Sci. Soc. Am. Meeting, Indianapolis, Indiana, November, 1996.
113. Yin, Y., H.E. Allen, C.P. Huang, D.L. Sparks, and P.F. Sanders. 1996. Kinetics of Hg(II) adsorption and desorption on soil. Soil Sci. Soc. Am. Meeting, Indianapolis, Indiana, November, 1996.
114. Scheidegger, A.M., D.G. Strawn, K.G. Scheckel, and D.L. Sparks. 1997. Use of in-situ surface spectroscopic and microscopic techniques to ascertain the fate and mechanisms of metal contaminants in the subsurface environment. 36th Intern. Union of Pure and Applied Chemistry Congress, Geneva, Switzerland, August 17-22.
115. Roberts, D.R., A.M. Scheidegger, and D.L. Sparks. 1997. Nickel sorption kinetics/mechanisms on the clay fraction of a soil: An XAFS study. Am. Chem. Soc. Meeting, Las Vegas, Nevada, September 7-11.
116. Matocha, C.J., and D.L. Sparks. 1997. Sorption kinetics of phthalate on manganese oxides. 71st Colloid and Surface Science Symposium, Univ. of Delaware, Newark, Delaware, June 29-July 2.
117. Scheckel, K.G., and D.L. Sparks. 1997. Influence of pH on surface precipitate formation of Ni(II) on pyrophyllite. 71st Colloid and Surface Science Symposium, Univ. of Delaware, Newark, Delaware, June 29-July 2.
118. Strawn, D.G., and D.L. Sparks. 1997. Kinetics and mechanisms of lead sorption and desorption at the γ -Al₂O₃/water interface. 213th Am. Chem. Soc. Meeting, San Francisco, California. April 13-17.
119. Scheidegger, A.M., G.M. Lamble, and D.L. Sparks. 1997. Monitoring the growth of secondary precipitates upon metal sorption on clay minerals and aluminum oxides using x-ray absorption fine structure (XAFS) spectroscopy. 213th ACS Meeting, San Francisco, California.
120. Yin, Y., H.E. Allen, and D.L. Sparks. 1997. A comparison of desorption kinetics of Hg(II) from soil using batch and stirred-flow methods. 213th ACS Meeting, San Francisco, California.
121. DiVincenzo, J.P., and D.L. Sparks. 1997. Evidence for different soil sorption mechanisms for the neutral and charged forms of pentachlorophenol. 213th ACS Meeting, San Francisco, California.
122. Matocha, C.J., and D.L. Sparks. 1997. Sorption kinetics of phthalate on

manganese oxides. 213th ACS Meeting, San Francisco, California.

123. Scheckel, K.G., A.M. Scheidegger, and D.L. Sparks. 1997. Ni(II) precipitation and dissolution kinetics on pyrophyllite: An in-situ AFM study. 213th ACS Meeting, San Francisco, California.
124. Roberts, D.R., and D.L. Sparks. 1997. Nickel sorption kinetics on the clay fraction of a soil. 213th ACS Meeting, San Francisco, California.
125. O'Reilly, S.E., and D.L. Sparks. 1997. The effects of residence time on the retention of arsenate by goethite. 213th ACS Meeting, San Francisco, California.
126. Ford, R.G., and D.L. Sparks. 1997. Physicochemical controls on the formation of polynuclear metal complexes at clay mineral surfaces. SSSA Meeting, Anaheim, California, October 26-30.
127. Arai, Y., D.L. Sparks, and J.T. Sims. 1997. Phosphorus desorption kinetics from field and laboratory amended soils. SSSA Meeting, Anaheim, California.
128. O'Reilly, S.E., and D.L. Sparks. 1997. The effect of residence time on arsenate sorption/desorption processes on mineral surfaces. SSSA Meeting, Anaheim, California.
129. Elzinga, E.J., and D.L. Sparks. 1997. Nickel sorption mechanisms in a mixed pyrophyllite-montmorillonite system. SSSA Meeting, Anaheim, California.
130. Roberts, D.R., A.M. Scheidegger, and D.L. Sparks. 1997. Nickel sorption/release on soil clay fractions: A kinetic and EXAFS study. SSSA Meeting, Anaheim, California.
131. Scheidegger, A.M., R.G. Ford, and D.L. Sparks. 1997. Use of x-ray absorption spectroscopy to monitor the kinetics of metal sorption reactions at the soil/water interface, SSSA Meeting, Anaheim, California.
132. Strawn, D.G., and D.L. Sparks. 1998. Use of a stirred-flow reactor to study Pb adsorption and desorption reactions on soil. SSSA Meeting, Baltimore, Maryland.
133. Scheckel, K.G., and D.L. Sparks. 1998. Time-resolved AFM and XAFS investigations of nickel surface precipitate dissolution mechanisms. SSSA Meeting, Baltimore, Maryland.
134. Peak, J.D., D.L. Sparks, R.G. Ford, W.R. McKinney, and M.C. Martin. 1998. The rates and mechanisms of borate and sulfate adsorption at the iron oxide/aqueous interface. SSSA Meeting, Baltimore, Maryland.
135. Roberts, D.R., and D.L. Sparks. 1998. Mechanism(s) of Ni sorption on Al-

hydroxy-interlayered vermiculite using time-resolved EXAFS. SSSA Meeting, Baltimore, Maryland.

136. Arai, Y., and D.L. Sparks. 1998. Residence time effects on P sorption/desorption on ferrihydrite. SSSA Meeting, Baltimore, Maryland.
137. Scheinost, A.C., R.G. Ford, K.S. Scheckel, and D.L. Sparks. 1998. Ni sorption on pyrophyllite: Evidence for the formation of Ni-Al hydroxide and its transformation into Ni-silicate by visible, infrared and XANES spectroscopy and thermogravimetry. SSSA Meeting, Baltimore, Maryland.
138. Matocha, C.J., and D.L. Sparks. 1998. Mechanisms of Reductive Dissolution of Mn oxides by catechol. SSSA Meeting, Baltimore, Maryland.
139. O'Reilly, S.E., and D.L. Sparks. 1998. Competitive effects of phosphate on the kinetics of arsenate sorption on goethite. SSSA Meeting, Baltimore, Maryland.
140. D.G. Strawn, and D.L. Sparks. 1998. Use of x-ray absorption spectroscopy to distinguish between inner and outer-sphere Pb adsorption complexes on montmorillonite. SSSA Meeting, Baltimore, Maryland.
141. Cooper, E.M., D.G. Strawn, J.T. Sims, D.L. Sparks, and B.M. Onken. 1998. Effect of chemical stabilization by phosphate amendment on the desorption of P and Pb from a contaminated soil. SSSA Meeting, Baltimore, Maryland.
142. Strawn, D.G., A. Scheidegger, and D.L. Sparks. 1998. Use of XAFS to determine the effects of time, ionic strength and pH on Pb sorption mechanisms at the gamma-Al₂O₃ and montmorillonite/water interface. The 10th International Conference on X-ray Absorption Fine Structure XAFS X, Chicago, Illinois.
143. Roberts, D.L., and D.L. Sparks. 1998. Effect of time and reaction conditions on the formation/dissolution of Ni surface precipitates on the clay fraction of a soil using EXAFS spectroscopy. 16th World Congress of Soil Science, Montpellier, France, August 20-26.
144. Scheckel, K.G., and D.L. Sparks. 1998. Kinetics and mechanisms of nickel sorption/dissolution at soil mineral surfaces employing atomic force microscopy. 16th World Congress of Soil Science, Montpellier, France, August 20-26.
145. Elzinga, E., and D.L. Sparks. 1998. Mechanisms of nickel sorption on illite: A molecular approach. 16th World Congress of Soil Science, Montpellier, France, August 20-26.
146. Scheckel, K.G., and D.L. Sparks. 1998. Assessment of Ni sorption mechanisms on soil mineral surfaces using time-resolved x-ray absorption fine structure (XAFS) spectroscopy. V.M. Goldschmidt Conference, Toulouse, France. Mineralogical Mag. Vol., 62A:1330-1331.

147. Scheinost, A.C., H. Stanjek, D.G. Schulze, U. Gasser, and D.L. Sparks. 1998. Structural environment and oxidation state of manganese in goethite-groutite solid-solutions: A Rietveld, EXAFS, XANES, and DRS study. The 17th General Meeting International Mineralogical Association, Toronto, Canada.
148. Scheckel, K.G., and D.L. Sparks. 1999. Kinetics of the formation and dissolution of Ni precipitates on a gibbsite/amorphous silica mixture. SSSA Meeting, Salt Lake City, Utah.
149. Scheinost, A.C., and D.L. Sparks. 1999. Kinetics and mechanisms of competitive metal sorption on ferrihydrite. SSSA Meeting, Salt Lake City, Utah.
150. Yamaguchi, N.U., and D.L. Sparks. 1999. Effects of Organic Ligands on the Rates and Mechanisms of Ni Sorption at the Mineral/Water Interface. SSSA Meeting, Salt Lake City, Utah.
151. Arai, Y., and D.L. Sparks. 1999. Phosphorus fraction dynamics in amended soils. SSSA Meeting, Salt Lake City, Utah.
152. Peak, J.D., D.L. Sparks, and E.J. Elzinga. 1999. In-situ spectroscopic studies of sulfate and selenate adsorption on iron (III) (hydr)oxides. SSSA Meeting, Salt Lake City, Utah.
153. Roberts, D.R., R.G. Ford, and D.L. Sparks. 1999. Zn sorption mechanisms on soil clay minerals and oxides. SSSA Meeting, Salt Lake City, Utah.
154. Matocha, C.J., and D.L. Sparks. 1999. Fundamental aspects of Mn oxide reactions with catechol. SSSA Meeting, Salt Lake City, Utah.
155. Elzinga, E.J., and D.L. Sparks. 1999. Sulfate sorption on goethite in the presence of Pb. SSSA Meeting, Salt Lake City, Utah.
156. Sparks, D.L., A.M. Scheidegger, D.R. Roberts, K.G. Scheckel, R.G. Ford, and A. Scheinost. 1999. Effect of residence time on the mechanisms of metal retention/release on soils. SSSA Meeting, Salt Lake City, Utah.
157. A.C. Scheinost, R.G. Ford, K.S. Scheckel, and D.L. Sparks. 1999. Ni sorption on pyrophyllite: Evidence for the transformation of layered Ni-AL doublehydroxide into a phyllosilicate precursor. 217th ACS National Meeting, Anaheim, California.
158. Arai, Y., and D.L. Sparks. 2000. Investigation of the residence time effect on phosphate (P) adsorption/desorption. Northeastern Branch of the American Society of Agronomy, Newark, Delaware.
159. Peak, D., Y. Arai, L. Miller, J.T. Sims, D. Ware, and D.L. Sparks. 2000. Speciation of phosphorus in alum-amended poultry litter using XANES spectroscopy. Northeastern Branch of the American Society of Agronomy,

Newark, Delaware.

160. Hunger, S., and D.L. Sparks. 2000. Reactions of phosphate at the gibbsite-water interface: A molecular scale investigation. Northeastern Branch of the American Society of Agronomy, Newark, Delaware.
161. Roberts, D.R., A.C. Scheinost, G. Lamble, and D.L. Sparks. 2000. Microscale Zn speciation in a smelter-contaminated soil using micro-XAS and XRF techniques. International Workshop on Surface Chemical Processes in Natural Environments, Monte Verita, Ascona, Switzerland.
162. Scheinost, A.C., R.G. Ford, K.G. Scheckel, N. Yamaguchi, and D.L. Sparks. 2000. The link between clay mineral weathering and the formation of Ni surface precipitates. International Workshop on Surface Chemical Processes in Natural Environments, Monte Verita, Ascona, Switzerland.
163. Gillot, F.S., and D.L. Sparks. 2000. Kinetic and speciation of Ni sorption on beidellite. SSSA Meeting, Minneapolis, Minnesota.
164. Hunger, S., and D.L. Sparks. 2000. Reactions of phosphate at the gibbsite-water interface: A molecular scale study. SSSA Meeting, Minneapolis, Minnesota.
165. Matocha, C.J., E.J. Elzinga, and D.L. Sparks. 2000. Reactivity of lead on solid Mn minerals. SSSA Meeting, Minneapolis, Minnesota.
166. Arai, Y., J. Dyer, and D.L. Sparks. 2000. Arsenic speciation in contaminated sites using microfocused X-ray absorption spectroscopy. SSSA Meeting, Minneapolis, Minnesota.
167. Nachtegaal, M., and D.L. Sparks. 2000. Nickel sequestration in a mixed kaolinite-humic acid system. SSSA Meeting, Minneapolis, Minnesota.
168. Roberts, D.R., and D.L. Sparks. 2000. The direct identification and stability of Zn species in contaminated soils. SSSA Meeting, Minneapolis, Minnesota.
169. Peak, J.D., and D.L. Sparks. 2000. Effect of reaction conditions on boron sorption on iron hydroxides. SSSA Meeting, Minneapolis, Minnesota.
170. Arai, Y., and D.L. Sparks. 2001. Microscale arsenic (As) chemical speciation in poultry litter. SSSA Meeting, Charlotte, North Carolina.
171. Arai, Y., and D.L. Sparks. 2001. In situ spectroscopic investigation on arsenate surface speciation at the hematite-water interface. SSSA Meeting, Charlotte, North Carolina.
172. Grafe, M., and D.L. Sparks. 2001. Direct arsenic speciation in soils using macroscopic and micro-focused spectroscopic techniques. SSSA Meeting, Charlotte, North Carolina.

173. Hunger, S., and D.L. Sparks. 2001. On the use of ³¹P NMR spectroscopy to determine chemical forms of phosphorus in soils. SSSA Meeting, Charlotte, North Carolina.
174. Nachtegaal, M., and D.L. Sparks. 2001. Kinetics and mechanisms of nickel sorption to a goethite-coated kaolinite. SSSA Meeting, Charlotte, North Carolina.
175. Nachtegaal, M., E.A. Ghabbour, G. Davies, and D.L. Sparks. 2001. Ni speciation in a humic acid-kaolinite system. Humic Substances Seminar V, Boston, Massachusetts.
176. Peak, J.D., D.L. Sparks, and J.T. Sims. 2001. Direct speciation of phosphate in alum-amended poultry litter using XANES spectroscopy. Annual Meetings of the Soil Science Society of America, Charlotte, North Carolina.
177. Peak, J.D., T.J. Sims, and D.L. Sparks. 2001. Direct determination of phosphate species in alum-amended poultry litter. SSSA Meeting, Charlotte, North Carolina.
178. Peak, J.D., and D.L. Sparks. 2001. Effects of sulfate on lead desorption from goethite. Annual Meetings of the Soil Science Society of America, Charlotte, North Carolina.
179. Peak, J.D., and D.L. Sparks. 2001. In situ spectroscopic studies of sulfate and borate adsorption mechanisms on iron oxides: Implications for surface complexation modeling. 221st National meeting of the ACS, San Diego, California.
180. Roberts, D.R., G.S. Senesi, U. Kukier, R. Chaney, and D.L. Sparks. 2001. Microscopic and spectroscopic speciation of Ni in soils in the vicinity of a Ni refinery. SSSA Meeting, Charlotte, North Carolina.
181. Staats, K.E., Y. Arai, and D.L. Sparks. 2001. Alum amendment effects on soil phosphorus stabilization in poultry litter amended sandy soils. SSSA Meeting, Charlotte, North Carolina.
182. Nachtegaal, M., E.A. Ghabbour, G. Davis, and D.L. Sparks. 2001. Ni speciation in a humic acid-kaolinite system. Humic substances seminar V, March 21-23, Northeastern University, Boston, Massachusetts.
183. Hunger, S., J.D. Peak, and D.L. Sparks. 2002. Spectroscopic investigation of calcium phosphate stabilization at the gibbsite/water interface. ACS National Meeting, April 7-11, Orlando, Florida.
184. Peak, D., and D.L. Sparks. 2002. A continuum of oxyanion adsorption mechanisms on metal oxides: Results from in situ spectroscopy. 17th World Congress of Soil Science, Bangkok, Thailand.
185. Peak, D., S.H. Hunger, Y.A. Arai, J.T. Sims, and D.L. Sparks. 2002. Direct

speciation of phosphate in poultry litter using XANES spectroscopy. 223rd National meeting of the ACS, Orlando, Florida.

186. Trivedi, P., D.L. Sparks, J.A. Dyer and K. Pandya. 2002. Spectroscopic evaluation of the role of background anions on metal sorption to ferrihydrite. ACS National Meeting, April 7-11, Orlando, Florida.
187. Trivedi, P., D.L. Sparks and D.H. McNear, Jr. 2002. Spectroscopic assessment of the Ni species in contaminated soils using a linear combination analysis approach. Advanced Light Source (ALS) Users Meeting, October 10-12, Lawrence Berkeley National Laboratory, Berkeley, California.
188. Sparks, D.L. 2002. Teaching soil chemistry: Challenges and opportunities. American Society of Agronomy Annual Meeting, November 10-14, Indianapolis, Indiana.
189. Kirk, L.E., Y. Arai and D.L. Sparks. 2002. Effects of ion adsorption on charge properties of birnessite. American Society of Agronomy Annual Meeting, November 10-14, Indianapolis, Indiana.
190. Grafe, M. and D.L. Sparks. 2002. Effect of Zinc (Zn (II)) on the adsorption mechanisms of arsenate (As(V)) at the goethite-water interface. American Society of Agronomy Annual Meeting, November 10-14, Indianapolis, Indiana.
191. Nachtegaal, M. and D.L. Sparks. 2002. A spectromicroscopic study of 3d transition metal interactions with humic acid: A bright future for humic acid research. American Society of Agronomy Annual Meeting, November 10-14, Indianapolis, Indiana.
192. Trivedi, P., D. McNear and D.L. Sparks. 2002. A linear combination analyses approach for directly speciating Ni contaminated soils. American Society of Agronomy Annual Meeting, November 10-14, Indianapolis, Indiana.
193. McNear, D.H. Jr. and D.L. Sparks. 2002. Dissolution of nickel oxide in a smelter contaminated soil. American Society of Agronomy Annual Meeting, November 10-14, Indianapolis, Indiana.
194. Nachtegaal, M., C. J. Jacobsen, and D. L. Sparks. 2003. X-ray microscopy and Cls NEXAFS studies of 3d metal interactions with humic acid. 225th Meeting of the Am. Chem. Soc., March 23-27, New Orleans, Louisiana.
195. Peak, D., G. W. Luther III, and D. L. Sparks. 2003. Effects of pH on boric acid bonding onto hydrous ferric oxide. 225th Meeting of the Am. Chem. Soc., March 23-27, New Orleans, Louisiana.
196. Trivedi, P., D. L. Sparks, J. A. Dyer, N. C. Scrivner, and K. Pandya. 2003. Metal sorption onto hydrated iron oxides in anoxic environments: Role of

- Fe(II) ions, reaction time, and temperature. 225th Meeting of the Am. Chem. Soc., March 23-27, New Orleans, Louisiana.
197. McNear, D.H. Jr., J. Everhart, E. Peltier, and D. L. Sparks. 2003. Trying to make the connection: Sol Ni speciation and plant accumulation. Soil Sci. Soc. Am. Meeting, November 2-6, Denver, Colorado.
 198. Peltier, E. F., and D. L. Sparks. 2003. Factors affecting Ni and Zn hydroxide precipitate formation in soils. Soil Sci. Soc. Am. Meetings, November 2-6, Denver, Colorado.
 199. Staats, K. E., D. L. Sparks and J. T. Sims. 2003. Phosphorus speciation in alum mended poultry litter: Effects of aging and Al:P ratio. Soil Sci. Soc. Am. Meetings, November 2-6, Denver, Colorado.
 200. Grafe, M., M. A. Marcus, and D. L. Sparks. 2003. In-situ speciation of arsenic contaminated soil using micro-focused x-ray fluorescence and x-ray absorption fine structure spectroscopy. Soil Sci. Soc. Am. Meeting, November 2-6, Denver, Colorado.
 201. Everhart, J. L., D. L. Sparks, R. L. Chaney and D. van der Lelie. 2003. Assessing the bioavailability of Ni in smelter contaminated soils. Soil Sci. Soc. Am. Meeting, November 2-6, Denver, Colorado.
 202. Toor, G. S., S. Hunger, J. D. Peak, J. T. Sims, and D. L. Sparks. 2003. Advances in the characterization of phosphorus in organic wastes. Soil Sci. Soc. Am. Meeting, November 2-6, Denver, Colorado.
 203. Grafe, M., M. J. Borda, and D. L. Sparks, 2004. Kinetics of metal-arsenate precipitate formation at the goethite-water interface. 227th Am. Chem. Soc. Meeting. March 28 P April 1, Anaheim, California.
 204. Peltier, E. and D. L. Sparks, 2004. Kinetics of nickel precipitate formation. 227th Am. Chem. Soc. Meeting. March 28 P April 1, Anaheim, California.
 205. Borda, M.J., and D. L. Sparks. 2004. Investigating dicarboxylic acid complexation on random stacked birnessite. 227th Am. Chem. Soc. Meeting. March 28 P April 1, Anaheim, California.
 206. McNear, D. H. Jr., E. Peltier, J. Everhart, D. L. Sparks, R. L. Chaney, S. Sutton, and M. Newville. Use of novel synchrotron-based techniques to explore the connection between metal speciation in soils and plants. 227th ACS National Meeting, Anaheim, California, March 28-April 1, 2004.
 207. Sparks, D. L. and M. Grafe. Kinetics of zinc/ arsenate co-sorption at the goethite-water interface. Soil Science Society of America Annual Meeting, Seattle, Washington, Nov.1-4, 2004.
 208. Peltier, E., R.K. Allada, A. Navrotsky, and D.L. Sparks. 2004 Formation and stability of nickel soil precipitates. 228th ACS National Meeting, August 22-

26, Philadelphia, Pennsylvania.

209. Tappero, R., E. Peltier, D.H. McNear and D.L. Sparks. Localization of competing metals (Ni, Co, and Zn) in Alyssum using micro-XRF and tomography. Soil Science Society of America Annual Meeting, Seattle, Washington, Nov.1-4, 2004.
210. Staats, K.E., and D.L. Sparks. Phosphate and organic acids as competing sorbates on amorphous aluminum oxide. Soil Science Society of America Annual Meeting, Seattle, Washington, Nov.1-4, 2004.
211. Dowding, C.E., M.J. Borda, M.V. Fey, and D.L. Sparks. Using Attenuated Total Reflectance Fourier Transform Infrared Spectroscopy to investigate the surface chemistry of a drying soil. Soil Science Society of America Annual Meeting, Seattle, Washington, Nov.1-4, 2004.
212. McNear, D. H., R. Tappero, and D.L. Sparks. Uptake and cellular compartmentalization of metals from the rhizosphere by hyperaccumulating plants: A real time approach using confocal microscopy. Soil Science Society of America Annual Meeting, Seattle, Washington, Nov.1-4, 2004.
213. Peltier, E. and D.L. Sparks. Predicting nickel precipitate formation in contaminated soils. Soil Science Society of America Annual Meeting, Seattle, Washington, Nov.1-4, 2004.
214. Tappero, R., M. Marcus, E. Peltier, R. L. Chaney, and D. L. Sparks. In situ speciation of Co in a Ni/Co hyperaccumulator using bulk and micro-focused X-ray absorption spectroscopy. 69th Annual Meeting of the Soil Science Society of America, November 8, 2005, Salt Lake City, Utah.
215. McNear, D. H. Jr., R. L. Chaney, D. L. Sparks. The Plant-Soil Interface: Soil Nickel Speciation and the Mechanisms of Nickel Hyperaccumulation. The ASA-CSSA-SSSA International Annual Meeting, Salt Lake City, Utah, November 6-10, 2005.
216. Seiter, J. and D. L. Sparks. Fate and Transport of Arsenic in Delaware Soils. The ASA-CSSA-SSSA International Annual Meetings, Salt Lake City, Utah. November 6-10, 2005.
217. Tappero, R., E. Peltier, R. L. Chaney, D.L. Sparks 2005. In situ Speciation of Cobalt in Ni/Co Hyperaccumulator Alyssum Murale Using Bulk and Micro-Focused X-Ray Absorption Spectroscopy. The ASA-CSSA-SSSA International Annual Meetings, Salt Lake City, Utah, Nov. 6-10.
218. Borda, M., B. Lafferty, A. Madison, M. Martin, J. Fuhrmann, and D.L. Sparks. 2006. Kinetics and Mechanism of Mineralogically- and Biologically-Assisted Arsenic Transformation: A Spectroscopic Assessment. 18th World Congress of Soil Science, Philadelphia, Pennsylvania, July 9-15.

219. Bourri, G., F. Trolard, and D.L. Sparks. 2006. Estimation of Thermodynamic Properties of Hydroxides, Oxides and Layered Double Hydroxides from the Electronegativities of the Elements. 18th World Congress of Soil Science, Philadelphia, Pennsylvania, July 9-15.
220. Lafferty, B., M. Borda, A. Madison, J. Fuhrmann, and D.L. Sparks. 2006. Kinetics and Mechanism of Mineralogically- and Biologically- Assisted Arsenic Transformation: A Macroscopic Assessment. 18th World Congress of Soil Science, Philadelphia, Pennsylvania, July 9-15.
221. McNear, D. Jr., R. L. Chaney and D.L. Sparks. 2006. The Influence of Soil Ni Speciation on the Phytoremediation Potential of Soils Surrounding an Historic Ni Refinery in Port Colborne, Ontario Canada. 18th World Congress of Soil Science, Philadelphia, Pennsylvania, July 9-15.
222. Paul, K.W., J.D. Kubicki, and D.L. Sparks. 2006. Sulfate Adsorption at the Fe-(hydr)oxide-H₂O Interface: Comparing Results from Hybrid MO/DFT Cluster and Periodic ab initio DFT Calculations. 18th World Congress of Soil Science, Philadelphia, Pennsylvania, July 9-15.
223. Peltier, E. and D. L. Sparks. 2006. The Influence of Surface Precipitation on Nickel Solubility, Bioavailability and Fate in Contaminated Soils. 18th World Congress of Soil Science, Philadelphia, Pennsylvania, July 9-15.
224. Rice, C. and D. L. Sparks. 2006. US Priorities in Soil Science Research. 18th World Congress of Soil Science, Philadelphia, Pennsylvania, July 9-15.
225. Rosen, B., R. Tappero, K. Paul, and D. L. Sparks. 2006. Effects of Ionic Strength on MES Sorption and Ni Sorption Kinetics at the Goethite-Water Interface. 18th World Congress of Soil Science, Philadelphia, Pennsylvania, July 9-15.
226. Seiter, J., W. W. Saylor and D. L. Sparks. 2006. Transformations in the Speciation of Arsenic in Poultry Litter. 18th World Congress of Soil Science, Philadelphia, Pennsylvania, July 9-15.
227. Shimizu, M. and D. L. Sparks. 2006. The Volatilization of Arsenic in Poultry Litter and Litter Amended Soils. 18th World Congress of Soil Science, Philadelphia, Pennsylvania, July 9-15.
228. McNear, D., Jr., R. L. Chaney and D. L. Sparks. 2006. The Influence of Soil Ni Speciation on the Phytoremediation Potential of Soils Surrounding an Historic Ni Refinery in Port Colborne, Ontario, Canada. 18th World Congress of Soil Science, Philadelphia, Pennsylvania, July 9-15.
229. Strongin, D.R., G. Liu, S. Debnath, K. W. Paul, F. M. Michel, J. B. Parise, and D. Sparks. 2006. Surface reactivity of ferrihydrite nanoparticles toward gaseous SO₂. 232nd Am. Chemistry Society National Meeting, San Francisco, California, September 10-14.

230. Tappero, R.V., R. L. Chaney, and D.L. Sparks. 2006. Spectromicroscopic Investigation of Cobalt Speciation in a Ni/Co Hyperaccumulator Plant used for Phytoremediation and Phytomining. 18th World Congress of Soil Science, Philadelphia, Pennsylvania, July 9-15.
231. Tappero, R.V., and D. L. Sparks. 2006. Root-induced Changes in Metal Speciation in the Rhizosphere and Metal Homeostasis in a Ni/Co Hyperaccumulator: A Spectromicroscopic Investigation 16th Annual V.M. Goldschmidt Conference, Melbourne, Australia, August 27 - September 1.
232. Tappero, R.V., and D.L. Sparks. 2006. Root-induced Changes in Metal Speciation in the Rhizosphere and Metal Homeostasis in a Ni/Co Hyperaccumulator: A Spectromicroscopic Investigation 16th Annual V.M. Goldschmidt Conference, Melbourne, Australia, August 27 - September 1.
233. Strongin, D. R., G. Liu, S. Debnath, K. W. Paul, F. M. Michael, J. B. Parise, and D. L. Sparks. 2006. Surface reactivity of ferrihydrite nanoparticles toward gaseous SO₂. 232nd Am. Chemistry Society National Meeting, San Francisco, California, September 10-14.
234. Shimizu, M. and D. L. Sparks. 2007. Methylarsenate Sorption Mechanisms on Metal Oxides, ASA-CSSA-SSSA 2007 International Annual Meeting, New Orleans, Louisiana, November 4-8.
235. Zhu, M., S. Parikh, M. Ginder-Vogel and D. L. Sparks. 2007. Effects of Environmental Conditions on the Properties of Biogenic Manganese Oxides, ASA-CSSA-SSSA 2007 International Annual Meeting, New Orleans, Louisiana, November 4-8.
236. Parikh, S.J., B.J. Lafferty, M.J. Borda and D.L. Sparks. 2006. Microbe-Mineral Interactions and the Influence on As Transformations in the Soil Environment. ASA-CSA-SSSA 2006 International Meetings, Indianapolis, Indiana, November 12-16.
237. Parikh, S. J., B. J. Lafferty, Z. Shi and D.L. Sparks. 2007. Use of In-situ ATR-FTIR Spectroscopy to Determine Rapid Reaction Kinetics at the Mineral/Water Interface. 9th International Conference on the Biogeochemistry of Trace Elements (ICOBTE), Beijing, China, July 15-19.
238. Parikh, S. and D. L. Sparks. 2007. The Influence of Phosphate and Sulfate on Arsenic Oxidation via Hydrous Mn-Oxides, ASA-CSSA-SSSA 2007 International Annual Meeting, New Orleans, Louisiana, November 4-8.
239. Ginder-Vogel, M. and D. L. Sparks. 2007. Real-Time Surface-Chemistry of Arsenite Oxidation by Hydrous Manganese Oxide, SA-CSSA-SSSA 2007 International Annual Meeting, New Orleans, Louisiana, November 4-8.
240. Khaokaew, S., R. Tappero, M. Ginder-Vogel, R. Chaney and D. L. Sparks. 2007. Cadmium Speciation and Release Kinetics in a Thai Paddy Soil Subjected to Varying Redox Regimes, ASA-CSSA-SSSA 2007 International

Annual Meeting, New Orleans, Louisiana, November 4-8.

241. Lafferty, B. and D. L. Sparks. 2007. Microbe-Mineral Interactions and their Influence on Arsenic Transformations in the Soil Environment, ASA-CSSA-SSSA 2007 International Annual Meeting, New Orleans, Louisiana, November 4-8.
242. Landrot, G. and D. L. Sparks. 2007. Kinetics of Chromium (III) Oxidation on Manganese Oxides Using Real-Time Molecular Scale Approaches, ASA-CSSA-SSSA 2007 International Annual Meeting, New Orleans, Louisiana, November 4-8.
243. Seiter, J. and D. L. Sparks. 2007. Direct Speciation and Distribution of Dietary Arsenic in Chicken Excreta and Tissues, ASA-CSSA-SSSA 2007 International Annual Meeting, New Orleans, Louisiana, November 4-8.
244. Seiter, J. and D. L. Sparks. 2007. Arsenic Status in Delaware Soils, ASA-CSSA-SSSA 2007 International Annual Meeting, New Orleans, Louisiana, November 4-8.
245. Shimizu, M. and D. L. Sparks. 2007. Methylarsenate Sorption Mechanisms on Metal Oxides, ASA-CSSA-SSSA 2007 International Annual Meeting, New Orleans, Louisiana, November 4-8.
246. Zhu, M., S. Parikh, M. Ginder-Vogel and D. L. Sparks. 2007. Effects of Environmental Conditions on the Properties of Biogenic Manganese Oxides, ASA-CSSA-SSSA 2007 International Annual Meeting, New Orleans, Louisiana, November 4-8.
247. Fischel, J.S., M. Ginder-Vogel, and D. L. Sparks. 2008. Arsenic Mobilization in the Critical Zone: Oxidation by Hydrous Manganese Oxide. 235th America Chemistry Society National Meeting, New Orleans, Louisiana, April 6-10.
248. Ginder-Vogel, M., S.J. Parikh, J.S. Fischel and D. L. Sparks. 2008. Real-time Surface-chemistry of Arsenite Oxidation by Hydrous Manganese Oxide: Impact of Oxyanions. 235th American Chemistry Society National Meeting, New Orleans, Louisiana, April 6-10.
249. Sparks, D.L., 2008. Frontiers in Exploration of Biogeochemical Processes in the Earth's Critical Zone: The Role of Scale and Interfaces, Louisiana State University, Baton Rouge, Louisiana, April 4.
250. Sparks, D.L., 2008. The Role of Synchrotron Radiation in Addressing Grand Challenges and Opportunities in Environmental Science. J. Bennett Johnston, Sr. Center for Advanced Microstructures and Devices (CAMD) Baton Rouge, Louisiana, April 4.
251. Feng, X., M. Ginder-Vogel, M. Zhu, and D. L. Sparks. 2008. Birnessite

- Formation and its Transformation in Acid Media. 236th American Chemistry Society National Meeting, Philadelphia, Pennsylvania, August 17-21.
252. Ginder-Vogel, M. and D. L. Sparks. 2008. Impact of Mineral Surface Modification on As(III) Oxidation by Hydrous Manganese(IV). Goldschmidt Conference 2008, Vancouver, Canada, July 13 - 18.
 253. Ginder-Vogel, M., J.S. Fischel, and D. L. Sparks. 2008. Inhibition of Heterogeneous As(III) Oxidation by Hydrous Mn(IV) Oxide by Mineral Surface Alteration. 236th American Chemistry Society National Meeting, Philadelphia, Pennsylvania, August 17-21.
 254. Hochella, M.F., Jr., S.K. Lower, P.A. Maurice, R.L. Penn, N. Sahai, D.L. Sparks and B.S. Twining. 2008. Nanominerals, Mineral Nanoparticles, and Earth Systems, Goldschmidt Conference 2008, Vancouver, Canada, July 13 - 18.
 255. Khaokaew, S., M. Ginder-Vogel, P. Kanghae, R. Chaney and D. L. Sparks. 2008. Elucidating Cadmium Speciation and Bioavailability in Thai Paddy Soils. 236th American Chemistry Society National Meeting, Philadelphia, Pennsylvania, August 17-21.
 256. Landrot, G. and D. L. Sparks. 2008. Surface Chemistry of Cr(III) Oxidation and Precipitation on Mn(IV) Oxides. 236th American Chemistry Society National Meeting, Philadelphia, Pennsylvania, August 17-21.
 257. Parikh, S.J., B. J. Lafferty, Z. Shi and D.L. Sparks 2007. Use of In-situ ATR-FTIR Spectroscopy to Determine Rapid Reaction Kinetics at the Mineral/Water Interface. 9th International Conference on the Biogeochemistry of Trace Elements (ICOBTE), Beijing, China, July 15-19.
 258. Parikh, S.J., B.L. Lafferty and D. L. Sparks. 2008. In situ Analysis of Biogeochemical Arsenic Transformations. 236th American Chemistry Society National Meeting, Philadelphia, Pennsylvania, August 17-21.
 259. Seiter, J. and D. L. Sparks. 2008. Effect of Storage Time on the Dynamics of As Speciation and Transformation in Heterogeneous Biosolid Material. 236th American Chemistry Society National Meeting, Philadelphia, Pennsylvania, August 17-21.
 260. Shimizu, M., M. Ginder-Vogel, S.J. Parikh, and D. L. Sparks. 2008. Methylarsenate Sorption to Aluminum Oxide. 236th American Chemistry Society National Meeting, Philadelphia, Pennsylvania, August 17-21.
 261. Zhu, M., M. Ginder-Vogel, S.J. Parikh, and D. L. Sparks. 2008. pH-induced Structural Change in Biogenic Mn(IV)-oxides. 236th American Chemistry Society National Meeting, Philadelphia, Pennsylvania, August 17-21.
 262. Zhu, M., K. W. Paul, J. Kubicki and D. L. Sparks. 2008. Quantum Chemical

Modeling Arsenic (III,V) Adsorption and Oxidation on Manganese Oxides. 236th American Chemistry Society National Meeting, Philadelphia, Pennsylvania, August 17-21.

263. Shi, Z., D.M. DiToro, H.E. Allen and D.L. Sparks. 2008. Modeling Zn Adsorption and Desorption to Soils. Proceedings of the 14th International Meeting of the International Humic Substances Society, Moscow-Saint Petersburg, Russia, September 14-19.
264. Fischel, J.S., M. Ginder-Vogel, and D.L.Sparks. 2008. Synthesis and Characterization of Nano-Mn(IV) Oxide Phases. GSA-ASA-CSSA-SSSA 2008 Joint Annual Meeting, Houston, Texas, October 5-9
265. Ginder-Vogel, M., J.S. Fischel, and D.L.Sparks. 2008. Rates and Mechanisms of Arsenite Oxidation by Nano-Mn(IV) Oxide Mineral Phases. GSA-ASA-CSSA-SSSA 2008 Joint Annual Meeting, Houston, Texas, October 5-9.
266. Ginder-Vogel, M., J.S. Fischel, and D.L. Sparks. 2008. Impact of Mineral Surface Modification on As(III) Oxidation by Mn(IV) Oxides. GSA-ASA-CSSA-SSSA 2008 Joint Annual Meeting, Houston, Texas, October 5-9
267. Khaokaew, S., M. Ginder-Vogel, R. Chaney and D.L.Sparks. 2008. Speciation and Release Kinetics of Cadmium and Zinc in Thai Paddy Soil. GSA-ASA-CSSA-SSSA 2008 Joint Annual Meeting. Houston, Texas, October 5-9.
268. Khaokaew, S., T. Rudrappa, H.P. Bais and D.L. Sparks. 2008. The Effect of Organic Acids from Rice (*Oryza sativa* L.) on Cadmium and Zinc Bioavailability in Thai Paddy Soils. GSA-ASA-CSSA-SSSA 2008 Joint Annual Meeting, Houston, Texas, October 5-9.
269. Lafferty, B. and D.L. Sparks. 2008. Kinetics of Arsenic Transformations in the Soil Environment. GSA-ASA-CSSA-SSSA 2008 Joint Annual Meeting, Houston, Texas, October 5-9.
270. Landrot, G. and D.L. Sparks. 2008. Real Time Kinetics of Ni-Al Layered Double Hydroxide (LDH) Formation on Pyrophyllite. GSA-ASA-CSSA-SSSA 2008 Joint Annual Meeting, Houston, Texas, October 5-9.
271. Parikh, S.J., C.M. Jonsson, C.L. Jonsson, M. Zhu, R.M. Hazen, D.A. Sverjensky and D.L. Sparks. 2008. Molecular Mechanisms of Glutamic and Aspartic Acid Sorption to Oxyhydroxide Minerals. GSA-ASA-CSSA-SSSA 2008 Joint Annual Meeting, Houston, Texas, October 5-9.
272. Shimizu, M., M. Ginder-Vogel, S. J. Parikh, and D.L. Sparks. 2008. Methylarsenate Sorption to Aluminum Oxide. GSA-ASA-CSSA-SSSA 2008 Joint Annual Meeting, Houston, Texas, October 5-9.
273. Zhu, M. and D.L. Sparks. 2008. Ni²⁺ Sorption on Biogenic Manganese

Oxides Formed at Various pHs. GSA-ASA-CSSA-SSSA 2008 Joint Annual Meeting, Houston, Texas, October 5-9.

- 274. Sparks, D.L., M. Ginder-Vogel, B.J. Lafferty, S.J. Parikh. 2009. A Multi-Scale Investigation of the Kinetics and Mechanisms of As(III) Oxidation on Hydrous Manganese Oxide. 19th V.M. Goldschmidt Conference, Davos, Switzerland, June 21-26.
- 275. Ginder-Vogel, M. G. Landrot, D.L. Sparks 2009. Quantification of rapid Environmental Redox Processes Using Quick-Scanning X-ray Absorption Spectroscopy (Q-XAS). 19th V.M. Goldschmidt Conference, Davos, Switzerland, June 21-26.
- 276. Khaokaew, S., P. Northrup, R. L. Chaney, M. Ginder-Vogel and D.L. Sparks. 2009. Speciation and Release Kinetics of Cadmium in Alkali and Acidic Paddy Soils: Application of X-Ray Absorption Spectroscopy (XAS). ASA-CSSA-SSSA 2009 International Annual Meeting. Pittsburgh, Pennsylvania, November 1-5.
- 277. Lafferty, B.J., M. Ginder-Vogel and D.L. Sparks. 2009. Microbe and Mineral Mediated Arsenic Transformations in the Soil Environment. ASA-CSSA-SSSA 2009 International Annual Meeting. Pittsburgh, Pennsylvania, November 1-5.
- 278. Landrot, G., M. Ginder-Vogel, and D.L. Sparks. 2009. Kinetics of Chromium(III) Oxidation by Manganese(IV) Oxides Using Quick X-Ray Absorption Fine Structure Spectroscopy (Q-XAFS). ASA-CSSA-SSSA 2009 International Annual Meeting. Pittsburgh, Pennsylvania, November 1-5.
- 279. Parikh, S.J., B. J. Lafferty, and D.L. Sparks. 2009. Environmental Influences On Mn-Oxide Catalyzed Arsenic Oxidation. ASA-CSSA-SSSA 2009 International Annual Meeting. Pittsburgh, Pennsylvania, November 1-5.
- 280. Shimizu, M., and D.L. Sparks. 2009. Methylarsenate Sorption to Soil. ASA-CSSA-SSSA 2009 International Annual Meeting. Pittsburgh, Pennsylvania, November 1-5.
- 281. Siebecker, M., T. Centofanti, R. Chaney and D.L. Sparks. 2009. Geogenic Nickel Speciation in Serpentine Soils and Its Relationship to Nickel Uptake in Hyperaccumulator Plants. ASA-CSSA-SSSA 2009 International Annual Meeting. Pittsburgh, Pennsylvania, November 1-5.
- 282. Zhu, M., M. Ginder-Vogel, S. J. Parikh and D. L. Sparks. 2009. pH Effects on the Structure of Biogenic Mn-oxides. 237th ACS National Meeting, Salt Lake City, Utah, March 22-26.
- 283. Zhu, M., K.W. Paul, J.D. Kubicki and D.L. Sparks. 2009. A Quantum Chemical and X-ray Absorption Spectroscopy Investigation of Arsenic and Nickel Sorption Mechanism on Mn-oxides. DFG-IUSS Symposium on

Advances in Molecular Modeling of Biogeochemical Interfaces-
Perspectives for Soil Research, Jena, Germany, October 6-9.

284. Zhu, M., M. Ginder-Vogel, B. Lafferty, G. Landrot and D.L. Sparks. 2009. Structural Study of Poorly Crystalline Layered Manganese Oxides Using the Atomic Pair Distribution Function Technique. ASA-CSSA-SSSA 2009 International Annual Meeting. Pittsburgh, Pennsylvania, November 1-5.
285. Khaokaew, S., P. Northrup, R. L. Chaney, M. Ginder-Vogel and D.L. Sparks. 2009. Speciation and Release Kinetics of Cadmium in Alkali and Acidic Paddy Soils: Application of X-Ray Absorption Spectroscopy (XAS). ASA-CSSA-SSSA 2009 International Annual Meeting. Pittsburgh, Pennsylvania, November 1-5.
286. Khaokaew, S., P. Northrup, R. L. Chaney, M. Ginder-Vogel and D.L. Sparks. 2009. Speciation and Release Kinetics of Cadmium in Alkali and Acidic Paddy Soils: Application of X-Ray Absorption Spectroscopy (XAS). ASA-CSSA-SSSA 2009 International Annual Meeting. Pittsburgh, Pennsylvania, November 1-5.
287. Ginder-Vogel, M., B.J. Lafferty, M. Zhu and D.L. Sparks. 2010. Simultaneous As(III) and As(V) Retention by Hydrous Mn(IV) Oxide. 239th ACS National Meeting, San Francisco, California, March 21-25.
288. Khaokaew, S., R. L Chaney, M. Ginder-Vogel, D. L. Sparks. 2010. Speciation and Release Kinetics of Cadmium and Zinc in Paddy Soils: Application of X-ray Absorption Spectroscopy (XAS). 239th ACS National Meeting, San Francisco, California, March 21-25.
289. Lafferty, B., M. Ginder-Vogel and D.L Sparks.. 2010. As Oxidation and Retention Mechanisms on Hydrous Mn(IV) Oxide (HMO). 239th ACS National Meeting, San Francisco, California, March 21-25.
290. Landrot, G. and D.L. Sparks. 2010. Chromium Speciation in Natural and Anthropogenic Cr-bearing Soils, using Micro-XAS, Micro-XRF, and Micro-XRD. 239th ACS National Meeting, San Francisco, California, March 21-25.
291. Shimizu, M., AND D.L. Sparks, D.L. 2010. Methylarsenate Distribution and Speciation in Soil. 239th ACS National Meeting, San Francisco, California, March 21-25.
292. Sparks, D.L., M. Ginder-Vogel and G. Landrot. 2010. In situ Characterization of Environmental Redox Reactions using Quick-scanning X-ray Absorption Spectroscopy (Q-XAS). 239th ACS National Meeting, San Francisco, California, March 21-25.
293. Zhu, M., M. Ginder-Vogel, S. J. Parikh and D. L. Sparks. 2009. pH Effects on the Structure of Biogenic Mn-oxides. 237th ACS National Meeting, Salt Lake City, Utah, March 22-26.

294. Abdala, D. and D.L. Sparks. 2010. Use of Extended X-Ray Absorption Fine Structure Spectroscopy (EXAFS) to Differentiate the Continuum Between Phosphate Sorption Mechanisms on Goethite. ASA-CSSA-SSSA 2010 International Annual Meetings, "Green Revolution 2.0: Food + Energy and Environmental Security," Long Beach, California, Oct. 31 - Nov. 3.
295. Aufdenkampe, A.K., D.L. Sparks, K. Yoo, L.A. Kaplan, and J.E. Pizzuto. 2010. Spatial and Temporal Integration of Carbon and Mineral Fluxes: A Whole Watershed Approach to Quantifying Anthropogenic Modification of Critical Zone Carbon Sequestration, 3rd Annual National CZO PI meeting, Boulder, Colorado, September 13-15.
296. Van Stan, J., S. Stotts, D. Levia, J. Pizzuto, D. Sparks. 2010. Christiana River Basin Critical Zone Observatory: Preliminary Results from the Vegetation Survey for Validation of Airborne LiDAR Imagery. 3rd Annual National CZO PI meeting, Boulder, Colorado, September 13-15.
297. Chen, C., A.K. Aufdenkampe, K. Yoo and D.L. Sparks. 2010. Distribution, Speciation, and Elemental Associations of Soil Organic Carbon under Varying Landscape Topographic Positions at the Molecular Scale. 3rd Annual National CZO PI meeting, Boulder, Colorado, September 13-15.
298. Chen, C. and D.L. Sparks. 2010. Molecular Scale Assessment of C Functional Group Distribution of Soil Humic Substances Under Varying Land Use and Topographic Position. ASA-CSSA-SSSA 2010 International Annual Meetings, "Green Revolution 2.0: Food + Energy and Environmental Security," Long Beach, California, Oct. 31 - Nov. 3.
299. Jones, L.C., B. Lafferty and D.L. Sparks. 2010. Coupled Biotic and Abiotic Arsenite Oxidation Kinetics with Heterotrophic Soil Bacteria and a Poorly Crystalline Manganese Oxide. ASA-CSSA-SSSA 2010 International Annual Meetings, "Green Revolution 2.0: Food + Energy and Environmental Security," Long Beach, California, Oct. 31 - Nov. 3.
300. Sparks, D.L. 2010. The Pathways and Processes Utilized to Develop the Critical Zone Observatories. ASA-CSSA-SSSA 2010 International Annual Meetings, "Green Revolution 2.0: Food + Energy and Environmental Security," Long Beach, California, Oct. 31 - Nov. 3.
301. Sparks, D.L. 2010. Kinetics of Rapid Redox Processes at the Mineral/Water Interface Using Quick-Scanning X-Ray Absorption Spectroscopy (Q-XAS). ASA-CSSA-SSSA 2010 International Annual Meetings, "Green Revolution 2.0: Food + Energy and Environmental Security," Long Beach, California, Oct. 31 - Nov. 3.
302. Yoo, K., A. Aufdenkampe and D.L. Sparks. 2010. Case Study: The Role of Pedology In Christina River Basin CZO. ASA-CSSA-SSSA 2010 International Annual Meetings, "Green Revolution 2.0: Food + Energy and Environmental Security," Long Beach, California, Oct. 31 - Nov. 3.

303. Zhu, M., C. Farrow, J. Post, K. Livi, S. Billinge, M. Ginder-Vogel, and D.L. Sparks. 2010. Structural Study of Biotic and Abiotic Nanocrystalline Manganese Oxides Using Atomic Pair Distribution Function Technique. 2010 GSA Annual Meeting, Denver Colorado, Oct. 31- Nov. 3.
304. Sparks, D.L., A. Aufdenkampe, O. Lazareva, S. Hicks, D. Montgomery, D. Arscott, L. Kaplan, D. Newbold and D. Levia. 2011. Christina River Basin Critical Zone Observatory (CRB-CZO): Wireless Environmental Sensor Network. University of Delaware on the Hill. Washington, DC, March 8.
305. Chen, C. P. Leinweber, A.K. Aufdenkampe and D.L. Sparks. 2011. Distribution and Speciation of Soil Organic Carbon along Hillslope Transects: Importance of Fe-redox Cycling. CZO National Meeting, Tucson, Arizona, May 8-12.
306. Lazareva, O., D.L. Sparks, A. Aufdenkamp, K. Yoo, S. Hicks and J. Kan. 2011. Role of Fe- and Mn- Redox Coupling on the Carbon Cycle in a Mixed Land Use Watershed. CZO National Meeting, Tucson, Arizona, May 8-12.
307. Yoo, K., A. Aufdenkampe, C. Chen and D.L. Sparks. 2011. Christina River Basin Critical Zone Observatory: Carbon-mineral interactions from molecular to basin scales in the Anthropocene, Goldschmidt 2011 conference, Prague, Czech Republic, August 14-19. p. 1224.
308. Lazareva, O., D.L. Sparks, A. Aufdenkamp, K. Yoo, S. Hicks and J. Kan. 2011. Role of Fe- and Mn- redox coupling on the carbon cycle in a mixed land use watershed: Christina River Basin Critical Zone Observatory. Goldschmidt 2011 conference, Prague, Czech Republic, August 14-19. p. 1279.
309. Zhu M., Lafferty B., Livi K., Sparks D.L., 2011. Cation effects on Mn²⁺ oxidation by nanoparticulate δ -MnO₂, 242nd American Chemical Society National Meeting, Denver, Colorado, Aug. 28-Sept. 1. Poster presentation.
310. Chen, C., P. Leinweber, A. Aufdenkampe, J. Wang, J. J. Dynes, and D.L. Sparks. 2011. Soil Organic Matter-Mineral Interactions Along Hillslope Transects: Importance of Iron-Redox Coupling Processes. ASA-CSSA-SSSA 2011 International Annual Meetings, "Fundamental for Life: Soil, Crop, & Environmental Sciences," San Antonio, Texas, Oct. 16-19.
311. Li, W. and D.L. Sparks. 2011. An Investigation on the Formation Mechanism of Zn/Al Layer Double Hydroxide Surface Precipitates On Aluminum Oxide . ASA-CSSA-SSSA 2011 International Annual Meetings, "Fundamental for Life: Soil, Crop, & Environmental Sciences," San Antonio, Texas, Oct. 16-19.
312. Siebecker, M., W. Li, and D.L. Sparks. 2011. An In Situ Real-Time Quick X-Ray Absorption Spectroscopic (Q-XAS) Investigation of Ni Precipitation On Al-Rich Soil Minerals. ASA-CSSA-SSSA 2011 International Annual

Meetings, "Fundamental for Life: Soil, Crop, & Environmental Sciences," San Antonio, Texas, Oct. 16-19.

313. Wu, Y. and D.L. Sparks. 2011. Effects of Dissolved Fe(II) On As(III) Oxidation and As(V) Sequestration by Hydrous Manganese Oxide. ASA-CSSA-SSSA 2011 International Annual Meetings, "Fundamental for Life: Soil, Crop, & Environmental Sciences," San Antonio, Texas, Oct. 16-19.
314. Lazareva, O., D. L. Sparks, A. Aufdenkamp, J. Kan, S. Hicks, J. LeMonte, W. Pan and C. Chen. 2012. Biogeochemical Transformation of Fe- and Mn- Along a Redox Gradient: Implications for Carbon Sequestration within the Christiana River Basin Critical Zone Observatory. Spring 2012 American Chemical Society National Meeting, San Diego, California, March 25-29.
315. Zhu, M. and D. L. Sparks. 2012. Interactions between Cations and Nanoparticulate Layered Mn Oxides – A X-ray Atomic Pair Distribution Functions (PDF) Analysis. Spring 2012 American Chemical Society National Meeting, San Diego, California, March 25-29.
316. Carter, S.E., D.L. Sparks, A.M. Rule, R. Tappero and E. Benson. 2012. Distribution and Speciation of Arsenic in Poultry Particulate Emissions, The 22nd V.M. Goldschmidt Conference, Montréal, Canada, June 24-29.
317. Ginder-Vogel, M., B. Lafferty and D.L. Sparks. 2012. As(III) Oxidation by δ -MnO₂: Kinetics, Mechanisms, and Inhibition, The 22nd V.M. Goldschmidt Conference, Montréal, Canada, June 24-29.
318. Lazareva, O., D.L. Sparks, W. Pan, J. Kan, and A. Aufdenkampe. 2012. Biogeochemical Dynamics of Aqueous Fe and Mn in Soil Pore-Waters and Stream with Respect to Dissolved Organic Matter (DOM) Quantity and Quality. The 22nd V.M. Goldschmidt Conference, Montréal, Canada, June 24-29.
319. Livi, K.J.T., B. Lafferty, M. Zhu, S. Zhang, A.-C. Galliot and D.L. Spark.. 2012. Nanoscale Measurement of Manganese Valence in Mn-oxides, The 22nd V.M. Goldschmidt Conference, Montréal, Canada, June 24-29.
320. Sparks, D.L., C. Chen, O. Lazareva, J. Lemonte, J. J. Dynes, J. Wang, and T. Regier. 2012. The Role of Metal Redox Coupling Processes in Carbon Cycling and Stabilization, The 22nd V.M. Goldschmidt Conference, Montréal, Canada, June 24-29.
321. Sparks, D.L. 2012. Grand Challenges in Soil and Environmental Sustainability: The Importance of Basic Biogeochemical Research. EUROSIL 2012, 4th International Congress of ECSSS, Bari, Italy, July 2.
322. Fischel, J.S., M. H.I Fischel, B. J. Lafferty, and D. L. Sparks. 2012. Arsenic Mobilization in the Critical Zone: Oxidation by Manganese Oxide Minerals. 244th ACS National Meeting, Philadelphia, Pennsylvania, August 19-23.

323. Moyer, C.E. R. Tappero, H. Bais and D. L. Sparks. 2012. Role of Iron Plaques in Immobilizing Arsenic in the Rice-root Environment. 244th ACS National Meeting. Philadelphia, Pennsylvania, August 19-23.
324. Ono, F. B., E. S. Penido, D. L. Sparks and L.-R. G. Guilherme. 2012. Understanding the Low Arsenic Bioaccessibility in Tailings From a Gold Mining Area. SSSA International Annual Meeting, Cincinnati, Ohio, Oct. 21-24.
325. Abdala, D. B., P. A. Northrup, and D. L. Sparks. 2012. Surface Loading and Time Effects on Phosphorus Sorption Mechanism Examined by Extended X-Ray Absorption Fine Structure Spectroscopy at the Goethite/Water Interface. SSSA International Annual Meeting, Cincinnati, Ohio, October 21-24.
326. Abdala, D. B., P. A. Northrup, and D. L. Sparks. 2012. Extended X-Ray Absorption Fine Structure Spectroscopic Determination of the Bonding Configuration of Orthophosphate Surface Complexes of Phosphate at the Goethite/Water Interface. SSSA International Annual Meeting, Cincinnati, Ohio, October 21-24.
327. Elbana, T., H. M. M. Selim and D. L. Sparks. 2012. Lead and Tin Transport and Retention in Soils: Miscible Displacement and Modeling. SSSA International Annual Meeting, Cincinnati, Ohio, October 21-24.
328. Li, W., Y. Wang and D. L. Sparks. 2012. Effect of Glyphosate on Zn Adsorption/Precipitation on Aluminum Oxide: A Molecular Scale Study Using Spectroscopic Techniques. SSSA International Annual Meeting, Cincinnati, Ohio, October 21-24.
329. Li, W. M. Zhu, and D. L. Sparks. 2013. Advances in Understanding the Chemistry of Light Elements at Environmental Interfaces. 245th American Chemical Society National Meeting & Exposition, New Orleans, Louisiana, April 7-11.
330. Feng, X., W. Li, M. Zhu, P. Northrup, and D. L. Sparks. 2013. Sorption Mechanism of Myoinositol Hexaphosphate on Boehmite: A ³¹P NMR and P EXAFS Study. 245th American Chemical Society National Meeting & Exposition, New Orleans, Louisiana, April 7-11.
331. Li, W., X. Feng, P. Northrup, J. D. Kubicki and D. L. Sparks. 2013. Glyphosate Sorption Mechanism at the Boehmite/Water Interface Using Solid State ³¹P NMR and P XANES. 245th American Chemical Society National Meeting & Exposition, New Orleans, Louisiana, April 7-11.
332. Chen, C. and D. L. Sparks. 2013. Effect of Ferrihydrite-organic Matter Coprecipitation on the Fe(II)-catalyzed Transformation of Ferrihydrite. 245th American Chemical Society National Meeting & Exposition, New Orleans, Louisiana, April 7-11.

333. Zhu, M. P. Northrup, D. L. Sparks and G. A. Waychunas. 2013. Sulfate Adsorption on Ferrihydrite Studied by Sulfur K-edge EXAFS Spectroscopy and Differential PDF Analyses. 245th American Chemical Society National Meeting & Exposition, New Orleans, Louisiana, April 7-11.
334. Chen, C., J. J. Dynes, J. Wang, T. Regier and D. L. Sparks. 2013. Mechanisms of Ferrihydrite-organic Matter Complex Formation via Adsorption and Coprecipitation. 245th American Chemical Society National Meeting & Exposition, New Orleans, Louisiana, April 7-11.
335. Siebecker, M., W. Li, S. Khalid and D. L. Sparks. 2013. Real-time Sorption and Precipitation of Nickel on Clay Minerals: An in situ Quick-EXAFS Investigation. 245th American Chemical Society National Meeting & Exposition, New Orleans, Louisiana, April 7-11.
336. Northrup, P. and D. L. Sparks. 2013. Advances in Spatially-resolved Tender-energy X-ray Absorption Spectroscopy at NSLS and NSLS-II. 245th American Chemical Society National Meeting & Exposition, New Orleans, Louisiana, April 7-11.
337. Ginder-Vogel, M., B. Lafferty and D.L. Sparks. 2013. As(III) Oxidation by Hydrous Manganese(IV) oxide: Kinetics, Mechanisms, and Inhibition. 245th American Chemical Society National Meeting & Exposition, New Orleans, Louisiana, April 7-11.
339. Lopes, G. 2013. Sequential extraction of Zn, Pb, and Cd in soils from a mining area. XXXIV Brazilian Congress of Soil Sciences, Florianopolis, Brazil, July 28-August 2.
340. Ono, F. B. 2013. Arsenic in Dust Particles around a Metal Mining Area. XXXIV Brazilian Congress of Soil Sciences, Florianopolis, Brazil, July 28-August 2.
341. Lazareva, O., D. L. Sparks, R. Landis, N.R. Grosso, J. Collins, J. A. Dyer, C.J. Ptacek, S. Hicks and D. Montgomery. 2013. Understanding Biogeochemical Transformation and Mobilization of Hg from River Bank Soils: South River, Virginia. Goldschmidt 2013, Florence, Italy, August 25-30.
342. Fischel, J. S., M. H. Fischel, B. Lafferty, 2014. Kinetics of Arsenic Oxidation by Manganese Oxide Minerals: The Influence of Origin and Structure on Reactivity. 247th American Chemical Society National Meeting and Exposition, March 16-20.
343. Starcher, A. N., W. Li, D. L. Sparks, 2014. Spectroscopic evidence of mixed divalent metal layered double hydroxide phase formation from the co-sorption of Fe(II) and Zn with Al-bearing mineral substrates. 247th American Chemical Society National Meeting and Exposition, March 16-20.

344. Starcher, A. N., W. Li, D. L. Sparks, 2014. Green rust formation from Fe(II) sorption to Al-bearing phyllosilicates with structure Fe impurities. 247th American Chemical Society National Meeting and Exposition, March 16-20.
345. Zhu, M., X. Feng and W. Li. 2014. Advances in Understanding the Environmental Geochemistry of Manganese (Mn) Oxides (Symposium). 247th American Chemical Society National Meeting and Exposition, March 16-20.
346. Feng, X., H. Zhao, F. Liu, W. Tan, G. Qiu, H. Yin, W. Li, M. Zhu, and D. L. Sparks. 2014. Transformation of Hexagonal Birnessite into Triclinic birnessite by aqueous Mn and the formation of todorokite. 247th American Chemical Society National Meeting and Exposition, Dallas, Texas, March 16-20.

G. Presentations to Agricultural Commodity Groups

1. Sparks, D.L. 1980. Potassium status of Atlantic Coastal Plain soils. College Fertilizer Conference, Virginia Beach, Virginia. Sponsored by Southern States Cooperative.
2. Sparks, D.L. 1980. Boron and potassium fertilization and leaching effects on sandy Delaware soils in an intensive corn management system. Maximum Yield Workshop, East Lansing, Michigan. Sponsored by Potash and Phosphate Institute.
3. Sparks, D.L. 1981. Boron and potassium fertilization to maximize corn yields on Delaware soils. College Fertilizer Conference, Williamsburg, Virginia. Sponsored by Southern States Cooperative.
4. Sparks, D.L. 1981. Leaching of boron and potassium in sandy Atlantic Coastal Plain soils. Maximum Yield Workshop, Freehold, New Jersey. Sponsored by Potash and Phosphate Institute.
5. Sparks, D.L. 1982. Kinetics and thermodynamics of potassium exchange in mixed systems. University of Delaware Research Foundation Luncheon, Newark, Delaware.
6. Sparks, D.L. 1982. Principles of soil testing. Delaware Crop Improvement Association Annual Meeting, Felton, Delaware.
7. Sparks, D.L. 1982. The chemistry and fertility of soil potassium. Delaware Vegetable Growers Association Annual Meeting, Dover, Delaware.
8. Sparks, D.L., and G.J. Hendricks. 1986. Broadcasting versus banding applications of K on Delaware soils as it affects corn (*Zea mays* L.) in an intensive management system. Agricultural Resources Day, Georgetown, Delaware.

9. Sparks, D.L. 1997. Metals in the soil environment, Mid-Atlantic Crop Management Workshop, Ocean City, Maryland, November 20.

H. Visiting Scholar Participation and Invitational Seminars

I have served as a Visiting Scholar and presented lectures and seminars at the following Universities, National Laboratories, and Institutes:

1. University of Kentucky, Lexington, KY, 1982
2. Rutgers University, New Brunswick, NJ, 1984
3. University of Maryland, College Park, MD, 1984
4. The Ohio State University, Columbus, OH, 1984
5. The Pennsylvania State University, State College, PA, 1985
6. Savannah River Ecology Laboratory, University of Georgia, 1985
7. University of Saskatchewan, Saskatoon, Canada, 1985
8. University of California, Riverside, CA, 1986
9. University of California, Berkeley, CA, 1986
10. Virginia Polytechnic Institute and State University, Blacksburg, VA, 1986
11. Nanjing Agricultural University, China, 1987, Canadian Potash Institute Lecturer
12. Jisiang Agricultural University, China, 1987, Canadian Potash Institute Lecturer
13. Hubei Institute of Soils and Fertilizer, China, 1987, Canadian Potash Institute Lecturer
14. U. S. Borax Research, Anaheim, CA, 1987
15. USDA-ARS Eastern Research Laboratory, 1988
16. Volcani Center, Bet Dagan, Israel, 1989
17. Technion University, Haifa, Israel, 1989
18. North Carolina State University, 1989, Raleigh, NC, Willie Woltz Distinguished Lecturer
19. University of Delaware, Newark, DE, Civil Engineering Dept., 1990

20. University of Delaware, Newark, DE, Provost's Dinner Seminar, 1990
21. University of Delaware, Newark, DE, Chemistry Dept., 1991
22. Justus von Liebig University, Giessen Germany, 1991
23. Institut fur Strahlenschutz, Neuherberg, Germany, 1991
24. Wageningen University, Wageningen, The Netherlands, 1991
25. Purdue University, West Lafayette, IN, 1991
26. Battelle, Pacific Northwest Laboratory, Richland, Washington, 1992
27. Rothamsted Experimental Station, Harpenden, England, 1993
28. University of Birmingham, Birmingham, England, 1993
29. Lancaster University, Lancaster, England, 1993
30. The Johns Hopkins University, Baltimore, MD, 1993
31. University of Saskatchewan, Saskatoon, Canada, 1995
32. Swiss Federal Institute of Technology, Zurich, Switzerland, 1995
33. University of Maryland, College Park, MD, Civil and Environmental Engineering Department, 1996
34. University of Delaware, Newark, DE, Chemistry Department, 1996
35. Paul Scherrer Institute, Villigen, Switzerland, 1997
36. Lawrence Berkeley National Laboratory, University of California, Berkeley, CA, 1997
37. DuPont Co., Wilmington, DE, 1997
38. Iowa State University, Ames, Iowa, 1998
39. DuPont Co., Wilmington, DE, 1999
40. Texas A&M University, College Station, TX, 1999
41. Northeastern University, Boston, MA, 1999
42. University of Delaware, Newark, DE, Civil and Environmental Engineering Dept., 1999

43. Stanford University, Palo Alto, CA, 1999
44. Pacific Northwest National Laboratory, Richland, WA, 1999
45. Hohenheim University, Stuttgart, Germany, 1999
46. Washington State University, Pullman, WA, March, 2000
47. Rutgers University, New Brunswick, NJ, April, 2000
48. University of Bari, Bari, Italy, May, 2000
49. Iowa State University, Ames, IA, October, 2000
50. University of California-Davis, Davis, CA, October, 2000
51. State University of New York, Stony Brook, NY, March, 2001
52. Harvard University, Cambridge, MA, May, 2001
53. Brookhaven National Laboratory, Upton, NY, May, 2001
54. University of Sydney, Sydney, New South Wales, Australia, November, 2001
55. CSIRO, Perth, Western Australia, Australia, November, 2001
56. CSIRO, Adelaide, South Australia, Australia, November, 2001
57. University of Melbourne, Victoria, Australia, November, 2001
58. CSIRO, Canberra, New South Wales, Australia, November, 2001
59. CSIRO, Townsville, Queensland, Australia, November, 2001
60. University of Kentucky, Lexington, March, 2002
61. Argonne National Laboratory, Chicago, May, 2002.
62. Lawrence Berkeley National Laboratory, Berkeley, June, 2002.
63. Princeton University, Princeton, October, 2002.
64. U.S. Geological Survey, Menlo Park, CA, October, 2002.
65. Roscoe Ellis, Jr. (21st) Lecturer, Kansas State University, Manhattan, Kansas, March 17, 2004.
66. Brookhaven National Laboratory, Upton, New York, May, 2005.

67. Princeton University, Princeton, NJ, May 2006
68. Old Dominion University, March, 2007
69. University of Kentucky, April, 2007
70. Carnegie Institution of Washington, May, 2007
71. China Agricultural University, July, 2007
72. Virginia Tech, October, 2007
73. Brookhaven National Laboratory, January, 2008
74. Center for Advanced Materials Design (CAMD), Louisiana State University, March, 2008
75. Louisiana State University, March, 2008
76. Virginia Tech, May, 2008
77. USDA, Beltsville, June, 2008
78. University of Florida, September, 2008
79. The Pennsylvania State University, October, 2008
80. University of California, Davis, Sept. 2009
81. Zhejiang University, Hangzhou, China, October, 2009
82. University of Saskatchewan, June, 2010
83. Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, Beijing, China, September, 2010
84. Swiss Federal Institute of Technology (ETH), Zurich, Switzerland, October, 2010
85. Chinese Academy of Sciences, Institute of Soil Science, Nanjing, China, September, 2011
86. Nanjing Agricultural Institute, Nanjing, China, September, 2011
87. Chinese Academy of Sciences, Institute of Applied Ecology, Shenyang, China, September, 2011
88. Chinese Academy of Sciences, Institute for Urban Environment, Xiamen, China, September, 2011

89. University of Saskatchewan, Saskatoon, Canada, May, 2012
90. Stanford University, Stanford, California, August, 2012
91. Wuhan University of Geoscience, Wuhan, China, September, 2012
92. Huazhong Agricultural University, Wuhan, China, September, 2012
93. University of Western Australia, Perth, Australia, November, 2012
94. University of South Australia, Adelaide, Australia, November, 2012
95. University of Queensland, Brisbane, Australia, November, 2012
96. University of Western Sydney, Sydney, Australia, November, 2012
97. The Kasetsart University, Bangkok, Thailand, March 2013
98. The Institute of Geochemistry Chinese Academy of Science, Nanjing, China, April, 2013
99. The Institute of Resource, Ecosystem and Environment of Agriculture, Nanjing Agricultural University, Nanjing, China, May, 2013
100. Universitat Rostock, Rostock, Germany, September, 2013
101. University of Wisconsin-Madison, Madison, Wisconsin, October, 2013
102. University of Massachusetts-Amherst, Amherst, Massachusetts, November, 2013
103. University of Wuppertal, Wuppertal, Germany, January, 2014

IV. Professional Activities

A. Memberships in Professional and Learned Societies, Activities and Positions Held:

1. American Society of Agronomy

Northeastern Soil Research Committee - Member - (1980-
 Soil Sample Bank Committee - Member (1980-1983)
 Membership Committee - Member - (1985-
 Co-Chairman American Society of Agronomy Northeastern
 Regional Branch Meetings - 1986
 Member, Research Awards Committee, Northeastern Branch,
 ASA - 1988-1989, Chairman, 1990
 Member, Visiting Scientist Awards Committee, 1988-1990
 ASA Editor, Revision of ASA Monograph 9, Methods of Soil

Analysis, Chemical methods, 3rd Edition
Executive Committee, 1998-
Joint Meetings Committee, 2002

2. Soil Science Society of America
President-Elect 1998-1999
President 1999-2000
Past President 2000-2001
Chaired a number of Sessions at National Meetings
Soil Science Research Award Committee, 1987-1988
Representative from SSSA to AAAS Chemistry Division,
1988-1991
Chairman-Elect, Div. S-2, Soil Science Society of America,
1987-1988
Chairman, Div. S-2, Soil Science Society of America,
1988-1989
Member - Soil Science Research Award Committee
Nominating Committee, Div. S-2, Soil Science Society
America, 1989-1992
Nominating Committee, Soil Science Society of America,
President, 1988-1989
Associate Editor, Soil Science Society of America Journal,
1985-1987
Technical Editor, (Divs. S-2, S-5, and S-9), Soil Science
Society of America Journal, 1988-
Feasibility Committee on Revision of Agronomy 9, Part 2,
Methods of Soil Analysis, Chemical and
Microbiological Methods
Co-Editor, Rates of Soil Chemical Processes, SSSA
Spec. Publ.
Board of Directors, 1989-1990
Fellows Committee, 1990-1991
Soil Science Research Award Committee, 1991-1992
SSSA Budget and Finance Committee, 1993-1997,
Chair, 1996, Past Chair, 1997
Council on History of SSSA, 1993-1997
Co-Chairman, Working Group on Equilibrium/Kinetics,
Div. S-2
M.L. and Chrystie M. Jackson Soil Science Award Comm., 1994-
1996
Co-Editor, "Future of Soil Chemistry", 1998 -
Co-Editor, "Chemistry of Soil Chemical Processes", 1998 -
President-Elect, 1998-1999
Honorary Members Comm., 1998 -
Distinguished Service Award Comm., 1998 -
Council Society of Scientific Presidents, 1998 -
Executive Committee, 1998 -
President, 1999-2000
Past President, 2000-2001
Associate Editor, Vadose Zone Journal, 2002-

Editorial Committee, RHistory of Soil ScienceS, 2002-

3. International Union of Soil Science (formerly International Society of Soil Science)
Vice-Chair Commission II (Soil Chemistry) 1994-1998
Chair, Commission II (Soil Chemistry) 1998 P
President-Elect, 2000-2002
President, 2002-2006
Past President, 2006-2010
Chair, Committee on Statutes and Structure, 2010-2014
Executive Committee, 2002-2014
4. National Academy of Sciences
U. S. National Committee on Soil Science, 1999;2010-
Committee on Toxicants and Pathogens in Biosolids, 2000-
5. IUSS Representative to International Council for Science (ICSU), 2002-
6. Clay Minerals Society
7. Sigma Xi
8. Gamma Sigma Delta
9. American Association for Advancement of Science
10. American Chemical Society
11. American Geochemical Society
12. Francis Alison Society
13. Phi Kappa Phi
14. American Geophysical Union

B. Editorial Boards

1. Associate Editor for Soil Chemistry (Division S-2),
Soil Science Society of America Journal, 1985-1987
2. Technical Editor, Soil Science Society of America Journal
Divs. (S-2, S-5, S-9), 1988-1989
Div. S-2, 1990-1993
3. Editorial Board for Geoderma, 1985 P
4. Editorial Board for Soil Science, 1987 -
5. Editor, Advances in Agronomy, 1990 -

6. Assoc. Editor, *Pedosphere*, 1998 -
7. Assoc. Editor, *Geochimica Cosmochimica Acta*, 2000- 2010
8. Assoc. Editor, *Environmental Soil Science Encyclopedia*, 2000-2005
9. Co-Editor-in-Chief, *Encyclopedia of Agricultural Sciences*, 2001-
10. Assoc. Editor, *Vadose Zone Journal*, 2002-2010
11. Assoc. Editor, *Soil Science Reviews*, 2002-
12. Co-Editor-in-Chief, *Geoderma*, 1994-2005.
13. Editorial Board, *Chemical Geology*, 2008-
14. Editorial Board, *The Handbook of Environmental Chemistry*, 2008-

V. University, College, and Departmental Service (as Faculty Member and Department Chairman)

A. University of Delaware

1. University
 - Faculty Senate 1982-1984, 1987-1989
 - Graduate Studies Committee 1982-1983
 - University Promotion and Tenure Committee 1989-1990
 - Task Force to Expedite Contracts and Grants, 1988-1989
 - Provost's Screening Committee
 - Committee to make Recommendations on Research at U. of D.
 - Provost's Committee, 1991
 - Budget Council, 1991-1993
 - Environmental Studies Committee-Provost, 1994 -
 - Delaware Biotechnology Institute Management Team 1998 -
 - Chair of Chairs Group for DBI, 1999 -
 - Member, Dean of Engineering Search Committee, 1999-2000
 - Chair, Crawford Greenewalt Chair in Plant Molecular Biology Search Committee (PLSC/DBI) 2000-2001
 - John Boyer Symposium Committee
 - Presidential Search Committee, 2006
 - Environmental Cluster Hire Committee, 2010-2011
 - Faculty Senate Committee on Student and Faculty Honors, 2009-; Chair, 2010-
 - Search Committee, Vice Provost for Research, 2012
 - Search Committee, Geochemistry Faculty Position, 2012
 - Search Committee, Provost, 2012

2. College

College Promotion and Tenure Committee, 1980-1981, 1984-1985;
1987-1988; Chairperson-1985; Chairperson-1988
College Honors Day Committee, 1980
Land Procurement Committee, 1981-1982
Delaware-Maryland Plant Food and Crop Protection-Board of
Directors 1985
Dean's Full Professor Advisory Committee, 1987
College Conference Committee, 1989
College of Agricultural Sciences Scholarship Committee, 1989-
Chair, Committee on Research/Extension Interactions, 1989
Dean's Search Committee, 1991
W.J. Benton Retirement Committee
Search Committee, Chair, Dept. of Food and Research Economics
Search Committee, Chair, Director of Agricultural Communications
Member, Search Committee,
Department of Biological Sciences, 1995-1996
Chair, Review of R. T. Allen, Entomology and Applied Ecology,
1995-1996
Member Search Committee, Assistant Dean for Operations, 1996
Search Committee, 2 positions in Department of Civil and
Environmental Engineering, 1996
Center for Agricultural Biotechnology and Environmental Sciences
Management Team, 1997 P1999
College Honors Committee, 2009-2012

3. Departmental

Graduate Studies Committee, 1979-1988
Graduate Studies Coordinator, 1988
Chairperson, Seminar Committee, 1981-1982
Curriculum Committee, 1981-1983
Promotion and Tenure Committee, 1979-1985; 1986-1988;
Chairperson, 1984, 1985, 1986

Soil Fertility Search Committee, 1980
Soil Testing Search Committee, 1980
Research Committee, Chairperson, 1983;
Member, 1986-1988
Agronomy Building Committee, Chairperson, 1984-1988
Chairperson, Search Committee, Research Associate II,
Soil Testing, 1984
Soil Physics Search Committee, 1988
Assistant Chairperson, Plant Science Department - 1983-1985
Chairperson, Search Committee, Soil Genesis Position, 1985
Member, Soil Microbiology Position, 1985
Chairperson, Leo Cotnoir Retirement Dinner, 1985
Co-Chairperson, M.R. Teel Retirement Dinner Committee, 1986
Member, Search Committee, Crop Management Position, 1986

Department Chairperson, 1989-2009
Promotion and Tenure Committee, 2010-2011

VI. Teaching Contributions

A. University of Delaware

Environmental Soil Chemistry
Kinetics and Surface Chemistry of Soils
Soil Science Seminar
Chemical and Mineralogical Analyses of Soils
Introduction to Soil Science
Professional Development

VII. Research Grant Awards

1. Cotnoir, L.J., C.R. Curtis, and D.L. Sparks. 1980. A preliminary investigation of conditions necessary for revegetation and possible reclamation of a fixed flue gas desulfurization (FGD) waste disposal site. Delmarva Power and Light Company. \$24,000
2. Sparks, D.L. 1980-1981. Boron and potassium fertilization and leaching effects on sandy Delaware soils in an intensive corn management system. Potash and Phosphate Institute. \$12,000
3. Sparks, D.L. 1980-1983. Boron fertilization of corn grown on Delaware sandy soils. U.S. Borax Corporation. \$4,800
4. Sparks, D.L. 1981. Thermodynamics of potassium exchange in soils using a kinetics approach. University of Delaware Research Foundation. \$9,500
5. Sparks, D.L. 1982-1984. Effect of timing of potassium applications on leaching and corn yield in Delaware soils in an intensive management system. Potash and Phosphate Institute. \$21,000
6. Sparks, D.L., and C.R. Curtis. 1982-1983. An assessment of acid rain effects on elemental release from soils into groundwater. Water Resources, U.S. Department of the Interior. \$12,500
7. Sparks, D.L., and R. Alvarez. 1984-1986. Vicariant fertilization for variable charge soils. Agency for International Development, Washington, D.C. \$150,000
8. Sparks, D.L. 1985-1986. Placement of potassium fertilizers in sandy Delaware soils. Potash and Phosphate Institute. \$20,000
9. Sparks, D.L. 1984-1987. Potassium-Cs⁺, Cs⁺-NH₄⁺, and Cs⁺-Ca²⁺ exchange and selectivity on clay minerals and sediments. Department of Energy, Savannah River Ecology Laboratory. \$33,000
10. Sparks, D.L. 1985-1987. Nitrate retention as it affects groundwater quality in mid-

Atlantic soils. United States Geological Survey. \$96,000

11. Sparks, D.L. 1986-1988. Chemistry and availability of potassium silicates in soils. E.I. DuPont de Nemours Corporation. \$26,000
12. Sparks, D.L., and S. Feigenbaum. 1986-1988. Effect of irrigation with brackish and sewage effluent waters on potassium reactions in soils. United States-Israel Binational Agricultural Research and Development Fund. \$190,000
13. Sparks, D.L. 1987-1988. Ion exchange equilibria on high organic matter content soils from Bikini Atoll. Bikini Atoll Rehabilitation Committee. \$32,000
14. Sparks, D.L. 1988-1990. Kinetics of borate sorption-desorption on soil constituents. U.S. Borax Research. \$31,000
15. Sparks, D.L. 1988-1993. Sorption and desorption of organics on smectite. E.I. DuPont de Nemours Corp. \$475,000
16. Sparks, D.L., J.T. Sims, and J.J. Fuhrmann. 1989-1991. Pesticide mobility and retention in sandy Delaware soils. USDA. \$73,000
17. Sparks, D.L. 1990-. Equipment grant for Department of Plant and Soil Sciences. Unidel Foundation. \$100,000
18. Sparks, D.L. 1991-1993. Dynamics of ionic reactions on filtercake materials. E.I. DuPont de Nemours Corp. \$107,000
19. Sparks, D.L. 1991-1993. Sorption and desorption kinetics of pesticides on Delaware soils and soil constituents. Department of the Interior, DE Water Resources Center. \$25,500
20. Sparks, D.L. 1991-1993. Desorption/dissolution kinetics of metals and radionuclides from soil components. Washington State University, Battelle - DOE. \$109,000
21. Dentel, S., and D.L. Sparks. 1991-1993. Equilibrium and kinetic studies of selective organic adsorption by surfactant-modified clays. U.S. Geological Survey. \$131,027
22. Sparks, D.L. 1992-1993. Effects of kinetics on boron mobility in soils. Foundation for Agronomic Research. \$40,000
23. Allen, H.E., C.P. Huang, and D.L. Sparks. 1990-1991. Adsorption of metals to New Jersey soils. N.J. Dept. of Environmental Protection. \$57,357
24. Sparks, D.L. 1991-1993. DuPont Science and Engineering Grant to Department of Plant and Soil Sciences, DuPont Co. \$30,000
25. Sparks, D.L., and Z.Z. Zhang. 1992-1994. Mechanisms of industrial contaminant interactions with soils, State of Delaware and DuPont Co. \$123,000

26. Sparks, D.L. 1992-1995. Desorption and redox behavior of Ni and Cr from lunar simulants using equilibrium and kinetic approaches, NASA. \$66,000
27. Sparks, D.L. 1994-1995. Use of x-ray absorption spectroscopy in remediation of contaminated soils. State of Delaware and DuPont Co. \$50,000
28. Sparks, D.L. 1994-1996. Mechanisms of industrial contaminant interactions with soils. DRP - State and DuPont Co. \$83,000
29. Sparks, D.L. 1994-1996. Use of x-ray absorption spectroscopy in remediation of contaminated soils. DRP - State and DuPont Co. \$83,000
30. Sparks, D.L. 1994. Acquisition of atomic force microscope. UNIDEL, \$75,000
31. Sparks, D.L. 1995. Effect of aging on the mechanisms of metal retention on soil components using x-ray absorption fine structure (XAFS) spectroscopy. College of Agric. Sciences Competitive Grant. \$25,000.
32. Sparks, D.L., A.M. Scheidegger, and G.M. Lamble. 1996. Effect of residence time on mechanisms of metal retention/release on soils. USDA-NRICGP. \$242,000
33. Sparks, D.L. 1996-1998. Mechanisms of industrial contaminant interactions with soils. DRP-State and DuPont Co. \$75,000
34. Sparks, D.L. 1996-1998. Use of X-ray absorption spectroscopy in remediation of contaminated soils. DRP-State and DuPont Co. \$135,000
35. Sims, J.T., and D.L. Sparks. 1996-1999. Geochemistry, geostatistics, and hydrology of phosphorous losses in agricultural drainage in the Atlantic Coastal Plain: Developing improved phosphorus management practices for surface water protection. USGS. \$208,160
36. Sparks, D.L. 1998-2001. Darryl RobertsUs NSF Fellowship. \$75,000
37. Sparks, D.L. 1999-2002. Derek PeakUs NSF Fellowship. \$75,000
38. Sparks, D.L. 1997-1998. Surface complexation modeling of metal retention/sequestration on sediments, soil components, and soils. DRP State and DuPont Co. \$75,000
39. Sparks, D.L. 1999-2000. Surface complexation modeling of metal retention/sequestration on sediments, soil components, and soils. DRP State and DuPont Co. \$50,000.
40. Sparks, D.L. 1999-2002. The influence of aging and competitive sorption on the stabilization of metals via surface precipitation in soils. USDA-NRICGP \$330,000
41. Sparks, D.L. 2000-2003. Stefan HungerUs USGS Fellowship. \$48,000

42. Sparks, D.L. 2001-2003. Surface complexation modeling of metal retention/sequestration on sediments, soil components, and soils. DRP State and DuPont Co. \$37,500
43. Sparks, D.L., Y. Jin, and A. M. Lenhoff. 2001-2004. Effect of colloids on virus survival and transport in porous media. USDA-NRICGP. \$315,000
44. Sparks, D.L., and J.T. Sims. 2002. Institute of Soil and Environmental Quality. USDA Special Grant. \$112,243.
45. Sims, J.T., and D.L. Sparks. 2002. USDA National Needs Graduate Fellowships. \$276,000.
46. Sparks, D.L and J. T. Sims. 2003-2006. Jen Seiter WRC Fellowship. Fate and Transport of Arsenic in Delaware Soils: Impacts on Water Quality. \$150,000.
47. Sparks, D.L. 2005-2008. Masayuki ShimizuUs ISEQ Fellowship. Using FTIR Spectromicroscopy to Measure Cr Transformations and Distributions on the Mineral Surface Over Time. \$51,000.
48. Sparks, D.L. 2004-2007. NSF IUSS Grant. \$48,000
49. Sparks, D.L. and S. Brantley 2005 - 2007. NSF. Collaborative Research: Towards a Weathering System Science Consortium: Two Conferences on Biogeochemistry of the Critical Zone. \$122,592.
50. Weir, D. S., K. Steiner, Sparks, D.L., C. Carey, and J. Rabolt. 2005 - 2008. NSF-EpSCoR and State of Delaware Research Infrastructure Improvement Program. \$12,000,000. National Science Foundation and State of Delaware
51. Sparks, D. L. and H. Allen. CSME: 2002 - 2006. EPA. The Impact of Surface Precipitation on Sequestration and Bioavailability of Metals in Soils. \$111,483.
52. Sparks, D. L. and M. Borda. NSF. 2005 - 2006. The Surface Structure and Reactivity of Mn-Oxides and Their Impact on As Transformations in the Environment: A Multi-Scale Approach. \$50,000.
53. Sparks, D.L., J. Fuhrmann, and H-Y. Holman. USDA. 2005 - 2008. Microbe-Mineral Interactions and their Influence on Arsenic-Transformations in the Soil Environment. \$375,000.
54. Sparks, D.L. DE EPSCoR. 2005 - 2007. Molecular Scale Assessment of Critical Zone Interfacial Reactions. \$81,832.
55. Huang, C.P., T. Beebe, and D.L. Sparks. DE EPSCoR. 2006 - 2007. The Oxidation of Carbon Nano-tubes (CNTs) and Its Environmental Implications. \$44,330.
56. Sparks, D.L. and D. Strongin. NSF. 2006 - 2009. Investigating the Surface Structure and Reactivity of Bulk and Nanometer Scale Manganese Oxides. National Science Foundation. \$329,572.

57. Sparks, D.L. and J. T. Sims. DNREC. 2004 - 2006. Fate and Transport of Arsenic in Delaware Soils: Assessing Potential Impacts on Water Quality. \$150,000
58. Sparks, D.L. EPA. 2006 - 2008. CSME: The Impact of Surface Precipitation on Sequestration and Bioavailability of Metals in Soils. \$77,000.
59. Bais, H. and D.L. Sparks. EPSCoR. 2006 - 2007. The role of root exudation in metal mobilization in the Nickel (Ni)-hyper-accumulating species *Alyssum murale*. \$50,000.
60. Sparks, D.L., D.S. Weir, K.V. Steiner, S.G. Borleske, and V. Kalavacharla and T.M. Powers. 2008-2013. Building research and education infrastructure to enhance environmental science and its application to Delaware \$20,000,000. National Science Foundation and State of Delaware.
61. Bais, H. and D.L. Sparks. EPSCoR. 2006 - 2007. The role of root exudation in metal mobilization in the Nickel (Ni)-hyper-accumulating species *Alyssum murale*. \$50,000.
62. Sparks, D.L., A. Aufdenkampe, L. Kaplan, J. Pizzuto, and K. Yoo. 2009-2014. CZO: Spatial and temporal integration of carbon and mineral fluxes: a whole watershed approach to quantifying anthropogenic modification of critical zone carbon sequestration. \$4,315,607. National Science Foundation.
63. Bais, H., D. Sparks and K. Czymmek EPSCoR 2009-2010. An intervention of organelle biochemistry to unravel the role of Nickel (Ni) hyperaccumulation mechanisms in *Alyssum murale*. \$49,603.
64. Ginder-Vogel, M., Sparks, D.L., and M.V. Johnston. EPSCoR. 2009-2010. Quantification of Metal Distribution and Speciation in Particulate Matter Emitted from Delmarva Poultry Houses. \$50,000.
65. Sparks, D.L., Pizzuto, J. and D. Levia. NSF. 2010-2011. Ground Truth Vegetation Characteristics for CZO LiDAR Study. \$30,031.
66. Sparks, D. L. , Elzinga, E. NSF 2012-2015. The Role of Layered Fe(II)-Al(III)-hydroxides in the Biogeochemical Cycling of Iron and Trace Metals in Riparian Environments \$262,415.
67. Duke, J., Sparks, D. L., Messer, K. and Michael, H. NSF 2012-2013. WSC Category 1 Water Sustainability in Coastal Environments: Exploratory Research for an Integrated Study of the Effect of Anticipated Sea Level Rise on Contaminated Site Risk. \$145,000.
68. Sparks, D. L. and Carter, S. Johns Hopkins University. 2011-2012. The National Institute for Occupational Safety and Health (NIOSH) \$15,500.

69. Sparks, D. L. and Lazareva, O. DuPont. 2012-2013. Understanding Biogeochemical Transformation and Mobilization of HG from River Bank Soils: South River, Virginia. \$62,404.

VIII. Teaching Grant Awards

1. Sparks, D.L., and J.T. Sims. 1983. University of Delaware Improvement of Instruction Grant. \$1,000
2. Sims, J.T., and D.L. Sparks. 1984. University of Delaware Innovativeness in Teaching Award. \$1,000

Graduate Student Advisees and Awards They Received

A. Advisees (Served as Major Professor)			<u>Awards Received</u>
Martin, H.	M.S.	1982	
Jardine, P.	M.S.	1983	Potash and Phosphate Fellowship, Presidential Career Award, and M.L. and Chrystie M. Jackson Soil Science Award, Distinguished Alumni Award
Evans, C.	M.S.	1983	University Scholarship
Carski, T.	Ph.D.	1986	University Fellowship, Northeastern Agronomy Society and Graduate Student Award
Ogwada, R.	Ph.D.	1986	
Schulthess, C.	Ph.D.	1987	University Fellowship, Emil Truog Award, SSSA
Sadusky, M.	M.S.	1987	University Scholarship, Potash and Phosphate Fellowship
Noll, M.	Ph.D.	1989	University Teaching Award
Eick, M.J.	M.S.	1990	Potash and Phosphate Fellowship
Zhang, P.	Ph.D.	1990	University Fellowship and Potash and Phosphate Fellowship
Fendorf, S.E.	Ph.D.	1992	University Fellowship, Outstanding Paper Award at Clay Minerals Society Meeting, 1991, Houston, TX, Theodore Wolf Dissertation Prize from UD, Emil Truog Soil Science Award, NE Branch of

			ASA Graduate Student Award, M.L. and Chrystie M. Jackson Soil Science Award, UD Presidential Citation Award
Toner, C.V., IV	Ph.D.	1993	University Fellowship
Stapleton, M.	Ph.D.	1995	University Fellowship, W.J. Benton Graduate Student Award, Lewis Publishers Graduate Student Award
Eick, M.	Ph.D.	1995	NASA National Fellowship
Tang, L.	Ph.D.	1996	
DiVincenzo	Ph.D.	1996	NEBASA Graduate Student Award
Ball, M.	M.S.	1996	
Zhou, M.	Ph.D.	1996	
Alcacio, T.	M.S.	1997	
Ware, D.	M.S.	1997	DuPont Fellowship
Arai, Y.	Ph.D.	2002	
O'Reilly, E.	M.S.	1998	Coll. of Agr. Sci. Fellowship, NEBASA Student Award
Roberts, D.	Ph.D.	2001	NSF Fellowship
Strawn, D.	Ph.D.	1999	University Fellowship, Presidential Early Career Award for Scientists and Engineer
Elzinga, E.	Ph.D.	2000	Coll. of Agr. Sci. Fellowship
Matocha, C.	Ph.D.	2000	DuPont Fellowship, Theodore Wolf Dissertation Prize from UD in the Physical and Life Sciences
Scheckel, K.	Ph.D.	2000	
Peak, D.	Ph.D.	2002	NSF Fellowship
Dyer, J.	Ph.D.	2002	Theodore Wolf Dissertation Prize in the Physical and Life Sciences
Nachtegaal, M.	Ph.D.	2003	
Hunger, S.	Ph.D.	2003	USGS Fellowship

Grafe, M.	Ph.D.	2004	University Competitive Fellowship
Kirk, L.	M.S.	2003	University Fellowship
Everhart, J.	M.S.	2003	
McNear, D. Jr.	Ph.D.	2006	University Fellowship, Best Student Paper Award, Geochemistry Div. 227th ACS National Meeting and University of Delaware Graduate Student Research Symposium, Graduate Student Oral Presentation Competition, First Place
Paul, K.	Ph.D.	2007	USDA National Needs Fellowship
Staats, K.	M.S.	2005	Institute of Soil and Environmental Quality (ISEQ) Fellowship
Han, J.	Ph.D.	2005	Institute of Soil and Environmental Quality (ISEQ) Fellowship
Tappero, R.	Ph.D.	2008	USDA National Needs Fellowship
Seiter, J.	Ph.D.	2009	DE Center for Water Resources Fellowship (USGS), Donald L. and Joy G. Sparks Graduate Fellowship in Soil Science
Lafferty, B.	Ph.D.	2010	University Fellowship, Donald L. and Joy G. Sparks Graduate Fellowship in Soil Science
Shimizu, M.	Ph.D.	2010	ISEQ Fellowship
Landrot, G.	Ph.D.	2011	
Khaokaew, S.	Ph.D.	2011	Anandamahidol Foundation, King of Thailand Fellowship
Zhu, M.	Ph.D.	2010	ISEQ Fellowship, UD Fellowship, Joe B. and Martha J. Dixon Award, SSSA and American Chemical Society, Div. of Environmental Chemistry, Graduate Student Award
Chen, C.	Ph.D.	2013	
Siebecker, M.	Ph.D.	2013	University Fellowship, Donald L. and Joy G.

			Sparks Fellowship
Abdala, D.	Ph.D.	2012	DENIN Fellowship
Jones, L. C.	M.S.	2011	DENIN and EPA STAR Fellowships
Wu, Y.	Ph.D.	2013	ISEQ Fellowship
Carter, S.	Ph.D.	2015	
Moyer, C.	M.S.	2012	
LeMonte, J.	Ph.D.	2016	DoD SMART Fellowship
Starcher, A.	Ph.D.	2016	Donald L. and Joy G. Sparks Graduate Fellowship
Pan, W.	Ph.D.	2014	
Fischel, J.	Ph.D.	2016	NSF Graduate Fellowship
Mihalic, J.	Ph.D.	2016	

B. Advisory and/or Oral Examination Committee

	<u>Degree</u>	<u>Year</u>	<u>Area</u>
Brauer, D.	M.S.	1980	Plant Science (Plant Physiology)
Gau, S.	M.S.	1980	Plant Science (Plant Physiology)
Adams, J.	Ph.D.	1982	Plant Science (Plant Pathology)
Solano, L.	M.S.	1982	Plant Science (Soil Fertility)
Scibek, J.	M.S.	1982	Marine Studies (Marine Studies)
Sadler, N.	M.S.	1982	Plant Science (Soil Fertility)
Jardine, J.	Ph.D.	1983	Plant Science (Soil Fertility)
Sandler, H.	M.S.	1983	Plant Science (Plant Pathology)
Levine, A.	M.S.	1983	Plant Science (Plant Pathology)
Berzonsky, W.	M.S.	1983	Plant Science (Plant Breeding)

Tien, P.	Ph.D.	1983	Civil Engineering
Solis, T.	M.S.	1985	Plant Science (Soil Fertility)
Kline, J.	M.S.	1986	Plant Science (Soil Fertility)
Bitzer, C.	M.S.	1986	Plant Science (Soil Fertility)
Tien, A.	Ph.D.	1987	Civil Engineering
Hsieh, S.	Ph.D.	1987	Civil Engineering
Park, S.	Ph.D.	1987	Civil Engineering
Gartley, K.	M.S.	1989	Plant Science (Soil Fertility)
Johnson, R.	Ph.D.	1989	Plant Science (Soil Fertility)
Liu, J.C.	Ph.D.	1989	Civil Engineering
Kresen, A.J.	M.S.	1990	Plant and Soil Sciences (Soil Microbiology)
Teaney, G.	M.S.	1990	Plant and Soil Sciences (Soil Microbiology)
Tang, Z.	Ph.D.	1991	Civil Engineering
Kingery, A.	Ph.D.	1995	Civil Engineering
Takayami, M.	Ph.D.	1995	Civil Engineering
MacIntosh, K.	Ph.D.	1995	Civil Engineering
Vadas, P.	M.S.	1995	Plant and Soil Sciences
Sallade, Y.	M.S.	1995	Plant and Soil Sciences
Jamrad, A.	Ph.D.	1993	Civil Engineering
Mozaffari, M.	Ph.D.	1993	Plant and Soil Sciences (Soil Fertility)
Li, Yimin	Ph.D.	1993	Plant and Soil Sciences (Soil Fertility)

Numerous Others Since 1993

C. Senior Degrees with Distinction (Served as Advisor) and Undergraduate Fellows

Jardine, P.	1981
Loux, M.	1981
Paterson, A.	1982
Sadusky, M.	1985
Toner, C., IV	1986
Edwards, D.	1990
Kuchak, A.	1993
O'Reilly, E.	1996
Staats, K.	2002
Rosen, B.	2005
Madison, A.	2005

D. Postdoctoral Fellows (Served as Supervisor)

Dr. M. Seyfried	1987
Dr. A. Bar-Tal	1987-1988
Dr. S. Grant	1987-1989
Dr. Z. Zhang	1988-1994
Dr. H. Sharma	1988
Dr. P. Zhang	1990-1991
Dr. R. Johnson	1990-1992
Dr. Y. Salingar	1991-1992
Dr. P. Grossl	1991-1993
Dr. A. Scheidegger	1993-1997
Dr. R. Ford	1997-1999
Dr. A. Scheinost	1997-1999

F.W. Clarke Award, 1999,
Geochemical Society

Dr. N. (Yamaguchi) Uesugi	1998-1999
Dr. F. Gillot	2000-2001
Dr. Giorgio Senesi	2000-2001
Dr. Paras Trivedi	2001-2003
Dr. Youwen You	2002-2003
Dr. Edward Peltier	2002-2005
Dr. Michael Borda	2003-2006
Dr. Shinwoo Lee	2003-2005
Dr. Tiffany Thomas	2004-2005
Dr. Zenqing Shi	2006-2007
Dr. Sanjai Parikh	2006-2008
Dr. Matthew Ginder-Vogel	2006-2010
Dr. Olesya Lazareva	2010-
Dr. Wei Li	2010-
Dr. Jianjun Yang	

E. Visiting Professors and Scholars (Conducted research in my laboratories)

Dr. R. Alvarez (Distinguished Visiting Professor)	1985-1986
Dr. N. Pasricha	1987-1988
Professor X. Jiahua	1988
Dr. C. Aharoni (Distinguished Visiting Professor)	1989-1990
Dr. R. Keren	1992-1993
Dr. D.D. Steffens, Justus Liebig University, Giessen, Germany,	1993-1994
J. Wu, Chinese Academy of Sciences, Peoples' Republic of China	1994
G. Hu, Chinese Academy of Sciences, Peoples' Republic of China	1994
J. Kleikemper, Institute of Terrestrial Ecology, Schlieren, Switzerland	1995-1996

Dr. S. Feigenbaum, Institute of Soils and Water, Bet Dagan, Israel, 1995

Dr. L.E. Katz, University of Maine, Orono, Maine, Fall, 1997

Dr. A. Shaviv, The Technion, Israel Institute of Technology, 1998-1999

Dr. D. Businelli, University of Perugia, Italy, 2001

F. Casciari, University of Perugia, Perugia, Italy, 2001

C. Dowding, University of Stellenbosch, Matieland, South Africa 2003-2004

Dr. Xionghan Feng, Huazhong Agricultural University, Wuhan, China, 2007-2008

Dr. Tingqiang Li, China 2008-2011

Dr. Marcelo Alves, 2009-2010

Dr. Yujun Wang, 2010-2011

Dr. Alejandra Jara, 2011-2012

Wipawan Thaymuang, Kasetsart University, Bangkok, Thailand, 2011-2012

Dr. Xionghan Feng, Huazhong Agricultural University, Wuhan, China 2011-2012

Boontarik Chimchart, Kasetsart University, Bangkok, Thailand, 2011-2012

Fabio Ono, Federal University of Lavras - UFLA/Brazil, 2012

Guilherme Lopes, Federal University of Lavras- UFLA/Brazil, 2012-2013

IX. Reviews of Manuscripts, Grant Proposals and External Peers

Ad hoc reviewer, Science, Nature, PNAS, Soil Science Society of America Journal, Agronomy Journal, Soil Science, Journal of Environmental Quality, Geoderma, Water Resources Research, Canadian Journal of Soil Science, Indian Journal of Science, Journal of Soil Science, Clays and Clay Minerals, European Journal of Soil Science, Environmental Science and Technology, Langmuir, Geochimica et Cosmochimica Acta, J. Colloid and Interface Science, American Journal of Science, J. Electroanalytical Chemistry.

I have reviewed approximately 600 manuscripts since I have been at the University of Delaware. I have also served as a member of review panels for grant proposals submitted to: the Office of the Science Advisor, Agency for International Development; the National Science Foundation; the Department of Energy (reviewed subsurface chemistry program in 1991); USDA; and Canadian Research and Engineering Council and Switzerland National Research Council. Additionally, I have served as an

external reviewer for a number of colleagues in the USA, Europe, and Asia who were seeking promotions, and served on two U.S. National Academy of Sciences Committees.

X. Editorial Boards

- A. Associate Editor - Soil Chemistry (Division S-2), Soil Science Society of America Journal (1983-1987)
- B. Technical Editor - Divs. S-2, S-5, and S-9, Soil Science Society of America Journal (Div. S-2, S-5, and S-9, 1989-1989, Div.S-2, 1990-1993)
- C. Editorial Board - Geoderma, (1985 -)
Co-Editor-in-Chief, 1994-2005
 - a. Editorial Board - Soil Science, (1987 -)
- D. Editor, Advances in Agronomy, (1989 -)
- E. Associate Editor, Pedosphere, (1998 -)
- F. Associate Editor, Geochimica Cosmochimica Acta, (2000 -2011)
- G. Associate Editor, Encyclopedia of Soil Science
- H. Associate Editor, Vadose Zone Journal, 2004-2010
- I. Editorial Board, Chemical Geology, 2008-
- J. Advisory Board, Handbook of Environmental Chemistry, 2008-

XII. Consulting

E. I. DuPont de Nemours Corp. 1983 -
Bikini Atoll Rehabilitation Committee
Research Triangle Institute
U. S. Borax Corp.
Department of Energy
Kencon, Inc.

SUMMARY OF ACCOMPLISHMENTS

Professional Activities

Dr. Donald L. Sparks is S. Hallock du Pont Chair of Soil and Environmental Chemistry, Francis Alison Professor, and former Chairperson, Department of Plant and Soil Sciences at the University of Delaware at Newark. He also holds joint faculty appointments in the Departments of Civil and Environmental Engineering and Chemistry and Biochemistry, and in the College of Marine Studies. He joined UD in 1979 and served as Assistant Professor at the University of Delaware from 1979-1983, Associate Professor from 1983-1987, Professor in 1987-1994, Distinguished Professor from 1994-2001 and T. A. Baker Professor from 2001-2002. In 1986, he served as a Visiting Professor at the University of California in Riverside and in 2005 at INRA in Aix-en-Provence. He served as Assistant Department Chairperson from 1983-1985 and has served as Chairperson beginning in January, 1989. In 2006, he was appointed as Director of the Center for Critical Zone Research. In 2009, he was appointed Director of the Delaware Environmental Institute (DENIN), a statewide institute housed at the University of Delaware that integrates environmental science, engineering, and policy (www.udel.edu/denin).

Dr. Sparks is internationally recognized for his research in the areas of: kinetics of soil chemical processes, surface chemistry of soils and soil components using in-situ spectroscopic and microscopic techniques and the physical chemistry of soil potassium. He has pioneered the application of chemical kinetics to soils and soil minerals including development of widely used methods, elucidation of rate-limiting steps and mechanisms, and coupling of kinetic studies with molecular scale investigations, particularly synchrotron based x-ray absorption spectroscopy. His discoveries on the formation and role of surface precipitates in the retention, fate and transport of metals in natural systems have received worldwide attention and had major impacts in the areas of sorption models, metal speciation and soil remediation/contamination. He is the author, coauthor, or editor, of 353 publications. These include: 86 edited or authored books, 53 book chapters, and 214 refereed papers. He is the author of two widely adopted textbooks, *Kinetics of Soil Chemical Processes and Environmental Soil Chemistry (1st and 2nd editions)*, published by Academic Press. He is the editor of: a textbook, *Soil Physical Chemistry (1st and 2nd editions)*; three monographs, *Rates of Soil Chemical Phenomena*, *Methods of Soil Analysis: Chemical Methods*, *Mineral-Water Interfacial Reactions: Kinetics and Mechanisms*; and the most prestigious serial review in the fields of crop and soil science, *Advances in Agronomy*. He has edited 75 volumes of *Advances in Agronomy* since assuming the editorship in 1990. He has presented his research findings at national and international symposia and has served as an invitational speaker at 88 universities and institutes in the United States, Canada, Asia, Australia and Europe.

Dr. Sparks has been the recipient of over \$42 million in grants and contracts from a number of governmental, academic and industrial sources including the Agency for International Development, Potash and Phosphate Institute, Departments of Agriculture, Interior, and Energy, Environmental Protection Agency, University of Delaware Research Foundation, the National Science Foundation (NSF), United States Borax Corporation, U.S.-Israel Binational Research and Development Fund, Bikini Atoll Rehabilitation Committee, the DuPont Corporation, the Unidel Foundation, and NASA.

Dr. Sparks has served as an invitation reviewer for numerous manuscripts in scientific journals and for grant proposals to the National Science Foundation, the Agency for International Development, U.S. Geological Survey, the Department of Energy, the USDA, the EPA, the

Canadian Research and Engineering Council and the Swiss National Science Foundation. He has served on the Editorial Boards of the Soil Science Society of America Journal (as Associate Editor, 1985-1987, Div. S-2, and as Technical Editor, Div. S-2, S-5, and S-9, 1988-1993). He served as Co-Editor-in-Chief of Geoderma and on the Editorial Boards of Soil Science, Advances in Agronomy, Pedosphere, Geochimica Cosmochimica Acta, Vadose Zone Journal, and Chemical Geology.

At the University of Delaware, Dr. Sparks was instrumental in building the soil science program, including the establishment of the federally funded Institute of Soil and Environmental Quality (ISEQ) and the establishment of the UD Center for Critical Zone Research (CCZR) and the Delaware Environmental Institute (DENIN). He has been very active in graduate education. He has served as major professor and mentor to 57 graduate students and 26 postdoctoral fellows who hold positions in academe, government, and industry in the U.S.A. and throughout the world. He has also served as host to Visiting Scholars and Professors from around the world. His graduate students have been the recipients of numerous awards and honors including Potash and Phosphate Institute International Fellowships (five students), UD Theodore Wolf Dissertation Prize in the Physical and Life Sciences (three students), University of Delaware Fellowships, Outstanding Northeastern Regional Agronomy Society Graduate Student Awards, NASA, NSF, DoD, EPA and USDA Graduate Fellowships. Two Ph.D. students, Drs. Christian P. Schulthess and Scott E. Fendorf, were the recipients of the Emil Truog Award from the Soil Science Society of America. Three of his students have received The Presidential Achievement Award from the University of Delaware and three students have received U.S. Presidential Early Career Awards in Science and Engineering. In 1999, Dr. Andre M. Scheidegger, a former postdoctoral associate, received the F.W. Clarke Medal from the Geochemical Society of America, the first soil scientist to receive this award.

Awards and Honors

Dr. Sparks has been the recipient of numerous awards and honors. In 1982, he was the recipient of the University of Delaware Potash Institute for his outstanding research on soil potassium. In 1985, he was recipient of the American Society of Agronomy's Visiting Scientist Award and in 1986 he received the Research Award from the Northeastern Branch, American Society of Agronomy. In 1987, Dr. Sparks was elected Chairman of the Soil Chemistry Division (Div. S-2) of the Soil Science Society of America. In 1989, he was named a Fellow of both the American Society of Agronomy and the Soil Science Society of America, the most prestigious honors given by both societies. In 1991, he received the F.D. Chester Distinguished Performance Award from the College of Agricultural Sciences and the M.L. and Chrystie M. Jackson Soil Science Award from the Soil Science Society of America. In 1994, he was named Distinguished Professor of Soil Science, the first such professorship in the College of Agricultural Sciences at the University of Delaware. In 1994, Dr. Sparks also received the Soil Science Research Award from the Soil Science Society of America and was elected Vice-Chair (Commission II, Soil Chemistry) of the International Society of Soil Science. In 1996 Dr. Sparks was the recipient of the University of Delaware's Francis Alison Award, which is the highest award that a faculty member can receive. The award is given for distinguished achievements in scholarship and one in profession, teaching, dedication and service to the university, and mentoring of students. In 1997, Dr. Sparks was elected Fellow of the American Association for the Advancement of Science. In 1998, he was elected President of the Soil Science Society of America and Chairman of Div. 2 (Soil Chemistry) of the International Union of Soil Sciences. In 2000, he was selected as President-Elect of the International Union of Soil Sciences, and installed as President in 2002. In 2001, he received the prestigious McMaster Fellowship from CSIRO, Australia. In 2001, he was

named the T. A. Baker Professor of Plant and Soil Sciences. In 2002, he received the University of Kentucky's Chapter of Gamma Sigma Delta Outstanding Alumnus Award, was the first recipient of the University of Delaware's Outstanding Doctoral Graduate Student Advising and Mentoring Award, and was named S. Hallock du Pont Chair of Plant and Soil Sciences. In 2003, he received the Gold Medal for Distinguished Achievements in research from the Polish Society of Soil Science and the Environmental Quality Research Award from the American Society of Agronomy. In 2005, he was named the Sterling B. Hendricks Memorial Lecturer by NSDA-ARC. In 2007, he received distinguished alumni awards from the University of Kentucky and Virginia Tech and was named an Honorary Member of the Polish Society of Soil Science. In 2008, he was elected Fellow of the Geochemical Society and the European Association of Geochemistry. In 2010 he received the Geoffrey Marshall Mentoring Award from the Northeastern Association of Graduate Schools and the Liebig Medal from the International Union of Soil Sciences. In 2011, he was one of 20 scientists/engineers from around the world to receive an Einstein Professorship from the Chinese Academy of Sciences, and was granted an Honorary Professorship from the Institute for Urban Environment, Xiamen, China.

Dr. Sparks served on the Scientific Advisory Committees of the Advanced Light Source at Lawrence Berkeley National Laboratory and the Center for Environmental Molecular Science (EMSI) at the State University of New York at Stony Brook, and the Steering Committee of the Institute of Soil and Environmental Quality (ISEQ) at the University of Delaware. Dr. Sparks has also served on several committees of the National Research Council/National Academy of Sciences, including the NAS U.S. National Committee for Soil Science. He has consulted with a number of major industries.