Matthew G. Siebecker, Ph.D.

Curriculum Vitae

Assistant Professor
Applied Environmental Soil Chemistry
Department of Plant and Soil Science
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EDUCATION

Ph.D. (2014) – Environmental Soil Chemistry, University of Delaware, Newark, DE. Dissertation title: *Environmental speciation, chemistry, stability and kinetics of nickel in soils, mineral systems and plants*.

B.S. (2006) – Double major in Environmental Sciences *and* Plant & Soil Sciences, University of Massachusetts at Amherst.

PROFESSIONAL APPOINTMENTS

2019 - present – Assistant Professor, Applied Environmental Soil Chemistry, Department of Plant and Soil Science, Texas Tech University

2016 - 2018 – Postdoctoral Research Associate, Delaware Environmental Institute (DENIN) and College of Agriculture and Natural Resources, University of Delaware, Newark, DE.

2014 - 2016 – Postdoctoral Research Associate, Chemical Oceanography (trace element marine geochemistry), School of Marine Science and Policy, College of Earth, Ocean and Environment, University of Delaware, Lewes, DE.

PUBLICATIONS

Oldham, V.E., **Siebecker, M.G.,** Jones, M.R., Mucci, A., Tebo, B.M., and Luther, G.W. **(2019)** The speciation and mobility of Mn and Fe in estuarine sediments. *Aquatic Geochemistry,* https://doi.org/10.1007/s10498-019-09351-0.

Sun, Q., Liu, C., Cui, P., Fan, T., Zhu, M., Alves, M. E., **Siebecker, M. G.**, Sparks, D. L., Wu, T., Li, W., Zhou, D., and Wang, Y. **(2019)** Formation of Cd precipitates on γ-Al2O3: Implications for Cd sequestration in the environment. *Environment International* 126, 234-241.https://doi.org/10.1016/j.envint.2019.02.036.

Giannetta, B., Zaccone, C., Plaza, C., **Siebecker, M. G**., Rovira, P., Vischetti, C., and Sparks, D. L. **(2019)** The role of Fe(III) in soil organic matter stabilization in two size fractions having opposite features. *Science of The Total Environment* 653, 667-674. DOI:10.1016/j.scitotenv.2018.10.361.

Siebecker, M. G., Chaney, R. L., and Sparks, D. L. **(2018)** Natural speciation of nickel at the micrometer scale in serpentine (ultramafic) topsoils using microfocused X-ray fluorescence, diffraction, and absorption. *Geochemical Transactions* 19, 14. DOI:10.1186/s12932-018-0059-2.

Gou, W., **Siebecker, M.G.,** Wang, Z., Li. W. **(2018)** Competitive sorption of Ni and Zn at the aluminum oxide/water interface: an XAFS study. *Geochemical Transactions*, 19, 9. DOI:10.1186/s12932-018-0054-7.

Siebecker, M.G., Li, W., Sparks, D.L. **(2017)** The important role of layered double hydroxides in soil chemical processes and remediation: What we have learned over the past 20 years. *Advances in Agronomy,* 147. DOI:10.1016/bs.agron.2017.10.001.

Siebecker, M.G. and Sparks, D.L. **(2017)** Structural differentiation between layered single (Ni) and double metal hydroxides (Ni–Al LDHs) using wavelet transformation. *The Journal of Physical Chemistry A*, 121, 6992-6999. DOI: 10.1021/acs.jpca.7b07940.

Siebecker, M.G., Chaney, R.L., Sparks, D.L. **(2017)** Nickel speciation in several serpentine (ultramafic) topsoils via bulk synchrotron-based techniques. *Geoderma*, 298, 35-45. DOI:10.1016/j.geoderma.2017.03.008.

Olson, L., Quinn, K.A., **Siebecker, M.G**., Luther, G.W., Hastings, D., Morford, J.L. **(2017)** Trace metal diagenesis in sulfidic sediments: Insights from Chesapeake Bay. *Chemical Geology*, 452, 47-59. DOI:10.1016/j.chemgeo.2017.01.018.

Siebecker, M.G., Madison, A.S., Luther, G.W. **(2015)** Reduction kinetics of polymeric (soluble) manganese (IV) oxide (MnO_2) by ferrous iron (Fe^{2+}). *Aquatic Geochemistry*, 21, 143-158. DOI:10.1007/s10498-015-9257-z.

Siebecker, M.G., Li, W., Khalid S., Sparks, D.L. **(2014)** Real-time QEXAFS spectroscopy measures rapid precipitate formation at the mineral-water interface. *Nature Communications*, 5, 5003. DOI:10.1038/ncomms6003.

Siebecker, M.G. (2014) Environmental speciation, chemistry, stability and kinetics of nickel in soils, mineral systems and plants. *Ph.D. dissertation*, University of Delaware.

Li, W., Livi, K.J.T., Xu, W.Q., **Siebecker, M.G.,** Wang, Y.J., Phillips, B.L., Sparks, D.L. **(2012)** Formation of crystalline Zn-Al layered double hydroxide precipitates on gamma-alumina: the role of mineral dissolution. *Environmental Science & Technology*, 46, 11670-11677. DOI:10.1021/es3018094.

Centofanti, T., **Siebecker, M.G.,** Chaney, R.L., Davis, A. P., Sparks, D.L. **(2012)** Hyperaccumulation of nickel by *Alyssum corsicum* is related to solubility of Ni mineral species. *Plant and Soil*, 359, 71-83. DOI:10.1007/s11104-012-1176-9.

EXAFS Tutorials: https://youtu.be/Il_wRqhqFM4 and https://youtu.be/0Kex6KXeGG8