



ABSTRACT

**Advances in the Use of Real-Time Molecular Scale Techniques and Kinetic Models to Elucidate Biogeochemical Processes in Natural Systems.**

Wednesday, January 09, 2019

09:35 AM - 09:50 AM

📍 Sheraton San Diego Hotel - Fairbanks C

Advances in the Use of Real-Time Molecular Scale Techniques and Kinetic Models to Elucidate Biogeochemical Processes in Natural Systems

The use of state-of-the-art, *in-situ* molecular scale spectroscopic techniques and coupled process models has greatly advanced our understanding of the kinetics of biogeochemical processes in natural, heterogeneous systems such as soils, sediments, particulates, and aquatic systems. These approaches enable one to make measurements at small and rapid temporal scales and simulate natural environmental conditions. Undoubtedly, the molecular and nano- scale characterization of microenvironments and interfacial reactions will become increasingly significant in understanding the interactions between chemistry, physics, and biology in natural environments. There are a number of areas dealing with soil and environmental biogeochemistry where the application of small scale and real-time spectroscopic methods and coupled process models are resulting in major frontiers. Several of these research frontiers will be presented including: quick X-ray absorption spectroscopy (Q-XAS) to study metal and metal(loid) sorption and redox reactivity at the mineral/water interface, high frequency adsorption kinetic assays and ultra-high resolution Fourier transform ion cyclotron mass spectrometry to determine temporal molecular partitioning and structure of organic matter on metal oxides, and models to describe coupled time-dependent adsorption/redox processes.

Author**Donald L. Sparks**[Find Similar](#)**View Related Events****Day:** [Wednesday, January 09, 2019](#)