

23 - Sorption mechanism of myoinositol hexaphosphate on Boehmite: A ^{31}P NMR and P EXAFS study

Xionghan Feng^{1,2}, xionghan@udel.edu, Wei Li¹, Mengqiang Zhu³, Paul Northrup⁴, Paul Northrup⁴, Donald Sparks¹. (1) Plant and Soil Sciences, University of Delaware, Newark, DE 19713, United States, (2) College of Resources and Environment, Huazhong Agricultural University, Wuhan, HuBei, China, (3) Earth Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA 94720, United States, (4) Department of Geosciences, Stony Brook University, Stony Brook, NY, United States

Sorption of inositol phosphates by soil colloids hinders their biodegradation and decreases P bioavailability. ^{31}P NMR and P EXAFS were applied to investigate the surface complex structure of myoinositol hexaphosphate (IHP) adsorbed on boehmite. Part of the P groups of adsorbed IHP bind as inner-sphere complexes. Most of the rest are also complexed with Al, dissolved from the surface of boehmite, via a similar configuration. Two distinct peaks at 0 and -6 ppm were observed in the ^{31}P NMR spectra, and the relative intensity of the -6 ppm peak increased with IHP loading, sorption time and decreasing pH. The $^{31}\text{P}\{^{27}\text{Al}\}$ REAPDOR results show that the chemical environments of the P groups for 0 and -6 ppm have a similar bidentate bridging configuration coordination to Al, but probably different in protonation degree. Phosphorus EXAFS data and DFT calculations are consistent with the surface complex configuration revealed from the NMR spectra.

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