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New model describes nickel and phosphate sorption

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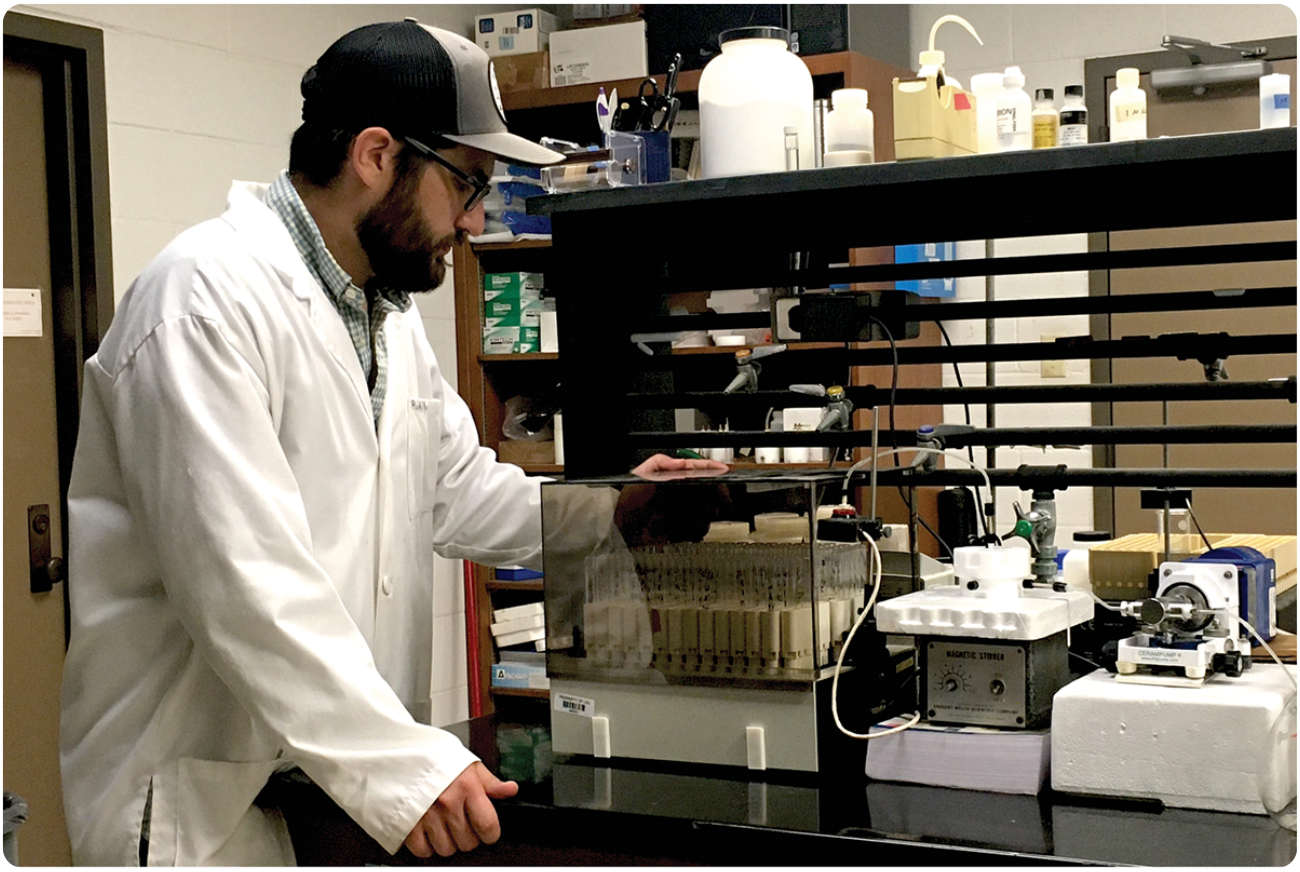

Lead author Josh Padilla monitors a sorption kinetics experiment like those done in this study. Photo by Easton Padilla.

Reactions between ions and the soil surface can be affected by other ions in the environment. For example, studies have shown that the presence of inorganic anions increases the sorption of several transition metal cations. Modeling the behavior of chemicals in soil is important for evaluating their environmental risk. However, many common approaches cannot account for interactions among multiple ions in a system.

In a new *Soil Science Society of America Journal* article, researchers investigated how phosphate affects the sorption of nickel (II) ions by soil. The authors found that phosphate increased both the total amount and rate of Ni(II) sorption while Ni(II) increased the amount of phosphate sorption but had no effect on its sorption rate. The authors then developed a model describing the sorption of Ni(II) in the presence of a range of phosphate concentrations, and vice versa, with a single set of parameters.

Phosphate fertilizers often contain heavy metal impurities, and mineral phosphate is commonly applied to remediate soils contaminated by heavy metals. Therefore, the model presented in this article could apply to a variety of settings and be more effective than traditional empirical approaches.

Dig deeper

Padilla, J.T., Gaston, L.A., & Selim, H.M. (2022). A Freundlich-type multi-component approach for modeling the sorption of nickel and phosphate in soil. *Soil Science Society of America Journal*. **https://doi.org/10.1002/saj2.20391**

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