Effect of Vermicompost and Two Types of Zeolite (Firoozkoh and Semnan) on the Kinetic of Nickel Fixation in Two Calcareous Soils

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Abstract

Current study conducted to evaluate the effects of vermicompost and zeolite on the kinetics of nickel (Ni) fixation. Treatments consisted of a factorial combination of two vermicompost levels (zero and 2 w/w percent), three zeolite levels (zero and 4 w/w percent of zeolite of Firoozkoh, and Semnan) and two soil textures (clay and sandy loam) in three replications. All treatments were spiked with 50 or 100 mg Ni kg^{-1}. DTPA extractable Ni was determined after 5, 10, 20, 30, 60 and 90 days. Ni availability was higher in sandy loam texture. Vermicompost application increased Ni availability in sandy loam texture in all the designated times. Zeolite application had no significant effect on Ni availability. The trend of Ni availability decrease was composed of two distinct stages with high and low Ni fixation rates. In the first step which continued up to 30 d, the available Ni fixation rate was high and then decreased sharply. Ni fixation data was suitably prescribed using simple Elovich and exponential equations. It seems that vermicompost has a greater effect to prevents Ni fixation and to retain it in available form in light texture soils. On the other hand, it seems that zeolite does not have any considerable effect on Ni fixation in calcareous soils.

Keywords: Fixation, Zeolite, Nickel, Vermicompost.

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