



Sorption of copper by vegetated copper-mine tailings

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The lixiviation of copper (Cu) from vegetated mine tailings may present an environmental risk because of the potential adverse effects it may pose to ground and surface water around mines. However, bonding of Cu to mine tailings can limit transfer to surrounding water. The main objective of the present study is to assess Cu sorption by cultivated Cu-mine tailings containing calcite (pH 7.7) as influenced by commercial peat moss-shrimp waste compost (PSC) and chelating solution. Fresh tailing and tailing that had been used in pot experiments were tested and compared. Samples (0.50 g) of tailings were equilibrated with 20 cm³ of 0.01 M CaCl₂ solution containing 100 mg Cu dm⁻³, as CuCl₂, for 72 h at room temperature. After equilibration period, the samples were centrifuged and filtered. Concentration of Cu in the equilibrium solution was measured by atomic absorption spectrophotometry. The sorption coefficient (K_s) was used to interpret the sorption data. The sorption experiment was replicated two times. Compost was the most effective organic amendment in enhancing Cu sorption. The K_s values were positively and significantly correlated with organic matter content and Cu associated with the organic fraction of tailing samples. The mineralogy and organic matter content can influence the sorption capacity of Cu-mine tailings. Calcite-containing mine tailings amended with PSC can be used to sorb Cu from chloride solutions.