

Abstract:

The effects of electrolyte concentration (C) and sodium adsorption ratio (SAR) on zinc sorption was studied. Top soil samples (0-30 cm) were taken from soils representing three arid-zone smectitic sites in the Gezira Scheme (Sudan). The orders of these soils are Vertisol [El-Hosh (now Wad El Ataya) and El-Suleimi] and Aridisol (El-Laota). These soils had no previous history of zinc application, and were previously equilibrated with mixed NaCl-CaCl<sub>2</sub> solutions to render different levels of SAR and salt concentration. Zinc retention decreased as electrolyte concentration increased, where maximum sorption occurred at low electrolyte concentration in soils having high pH and high negative charge. Sodium adsorption ratio had little effect on Zn sorption as precipitation prevailed at high pH. It was also found that the sorption capacity of the three soils were similar despite the variation in CaCO<sub>3</sub> and clay contents, hence cation exchange capacity and surface area. The results indicated that Zn was more soluble in the saline phases of Gezira soils, whereas sodicity had little effect.