

Abstract

Little attention has been paid to the influence of KCl fertilizer on Cd release from tropical soils. The objective of this study was to investigate the influence of KCl on the release of Cd from selected tropical soils from Kenya. The Cd released from the natural soils and the soils treated with the Idaho monoammonium phosphate (MAP)-fertilizer by KCl fertilizer as a function of reaction time was determined using a graphite furnace atomic absorption spectrophotometer (GFAAS). No detectable amounts of Cd were released from the natural soils by deionized distilled water; however, appreciable amounts of Cd were released from the treated soils by deionized distilled water. The Cd released from the soils by KCl is attributed to the formation of Cd-chloride complexes and the ionic strength effect. The parabolic diffusion equation was found to fit best the data for the kinetics of Cd released from the soils studied. The overall diffusion coefficient values of the Cd released from the natural and the treated soils by KCl fertilizer varied with the soil type. In the case of the treated soils, the rates of Cd released from the soils by KCl fertilizer were much higher compared to those for the Cd released by deionized distilled water, indicating that KCl induced the enhancement of the rate of Cd released from the soils. The impact of KCl fertilization on the mobility of Cd and its subsequent food chain contamination, thus, merits attention.