

Speciation and Release Kinetics of Lead in an Acidic Paddy Soil under Various Flooding Periods and Draining Conditions

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Pb is an important product of mining activities, it can be toxic at high concentration and easily adsorbed in paddy soil. This study determined speciation and release kinetics of Pb in a contaminated acidic paddy soil under various flooding periods and draining conditions by employing synchrotron-based techniques and a stirred flow kinetic method near Shangba village, which is an acid mine drainage (AMD) area in south China. Results revealed that the concentration of Pb in soil decreases with depth and the maximum concentration is 156.335 mg/kg. Varying flooding periods and draining conditions have low affected on Pb speciation and its release kinetics. Under all flooding and draining conditions, only 0.028 mg/kg Pb was desorbed from the soil after a 2-hour desorption experiment. Linear least-squares fitting (LLSF) of X-ray absorption near-edge structure (XANES) spectra of the soil samples, showed that more than 82% of Pb was bound to humic acid on surface soil(0~60cm) and more than 65% of Pb was bound to mineral on bottom soil.