

The Fate Of Heavy Metals In A Stabilization Pond System Treating Household Wastewater

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Abstract

The waste stabilization pond system in Taman Kota Permai, Seberang Perai Tengah, Penang consisting of two facultative ponds in parallel and a maturation pond connected to each of them in series is being used to treat domestic sewage. This study investigates the removal efficiency of trace metals (Zn, Cu, Pb, and Cd) and their speciation in this stabilization pond system.

The percentage of the removal of the dissolved heavy metal concentrations throughout the treatment path from the raw sewage to the final effluent was for zinc (79%), copper (63%), lead (73%) and cadmium (66%). The removal efficiency of these heavy metals was found to be most obvious in the facultative ponds. The mean percentages of the removal of these heavy metal concentrations in these ponds were zinc (65%), copper (50%), lead (64%) and cadmium (49%).

Trace metals species are differentiated utilizing anodic stripping voltammetry (ASV) and their labilities towards ammonium form chelex resin in successive column and batch procedures. Species are classified as being ASV-labile, moderately labile, slowly labile and inert. It was observed that there was some reduction in the percentage of ASV-labile species and moderately labile species along the treatment path. However, there was an increase in the percentage of the other two species. This phenomenon could be due to the formation of complexes with organic matters.

Keywords: STABILIZATION POND, SPECIATION, LABILITIES, TRACE METALS