

Effects of Cu(II) and Cd(II) on the performance of sequencing batch reactor treatment system

Abstract

The effects of Cu(II) and Cd(II)-containing wastewater on activated sludge microorganisms were investigated. The addition of Cu(II) and Cd(II) affected significantly the activities of activated sludge microorganisms in the bio-oxidation process, as indicated by drastic reduction in the specific oxygen uptake rate (SOUR) values. The sequencing batch reactor (SBR) system was operated with FILL, REACT, SETTLE, DRAW, and IDLE modes in the time ratio of 0.5:3.5:1.0:0.75:0.25 for one cycle time of 6 h. The addition of Cu(II) and Cd(II)-containing synthetic wastewater into the SBR system decreased the chemical oxygen demand (COD) and metals removal efficiencies. The examination of the pseudo first-order rate constant, k' , providing a quantitative estimate of the inhibitory effect of the metal, showed that the k' value with the metals addition was around 10 times lower than that without metals addition.

Keywords

Heavy metals; Sequencing batch reactor; SOUR; Wastewater treatment