

Change in batch kinetics of phenol biodegradation due to changes in the physiological state of the bacteria and the initial amount of phenol fed

Mehmet S. Okaygun and Aydin Akgerman

Department of Chemical Engineering, Texas A&M University, College Station, TX 77843-3136 (USA)

Abstract

Phenol biodegradation was studied using acclimated activated sludge at two different physiological states of the bacteria: (1) the bacteria were starved (feeding frequency was once per two days) and (2) the bacteria were continuously fed in the batch mode (feeding frequency was once per 6–7 hours). Phenol was used as the sole carbon source. During the batch experiments, the phenol concentration and the total suspended solids were measured continuously. It was shown that the kinetics of phenol biodegradation changed from Monod to Haldane as the feeding frequency increased. In batch studies with very high initial phenol concentration, although the bacteria were starved, the bacterial growth was inhibited at the beginning of the batch study. All of the data were obtained by using mixed sludge from one specific reactor which had the same culture history. The microbial populations were analyzed both when they were starved and were continuously fed in the batch mode. There were not any microbial shifts in the microbial species at the two different states. Therefore, the change in the batch kinetics of phenol biodegradation was due to two reasons: the change in the feeding frequency and the initial amount of phenol fed to the bacteria. It was also shown that the sludge yield may not stay constant during a batch study irrespective of the feeding frequency.

Characteristics of metal capture during fluidized bed incineration of waste contaminated with lead nitrate

T.C. Ho, L. Tan, C. Chen and J.R. Hopper

Department of Chemical Engineering, Lamar University, P.O. Box 10053, Beaumont, TX 77710 (USA)

Abstract

The emission of toxic metals during the incineration of solid wastes contam-