

Feasibility of biological nitrification process for treatment of fertilizer industry water

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Abstract

Fertilizer industries produce highly polluting and toxic liquid wastes containing urea, ammonia, arsenic, fluoride and chromium. These wastes are not readily amenable to any of the conventional biological treatments. This study deals with the biological treatments. This study deals with the biological nitrification process for ammonia removal. It also deals with the analysis of the toxicity of fluoride, arsenic and chromium compounds that may be present in the wastes to the nitrifying organisms.

The study shows that fluoride concentrations ranging from 1.0 mg/l to 300 mg/l and arsenic concentrations ranging from 0.5 mg/l to 150 mg/l had no perceptible effect on the efficiency of ammonia removal. Arsenic concentrations of 30 mg/l and 75 mg/l exerted an initial shock on the organisms which caused the utilization capacity to drop in the first 24 hours following the addition of toxicant. However, a rapid recovery took place on the following day. With respect to chromium, the study shows that a concentration of 1 mg/l and higher causes a decrease in the activity of nitrifying organisms. The activity is reduced to about 40 percent when the chromium concentration is in the range of 10 mg/l to 20 mg/l.