Enzyme Application's Effectivity in Activated Sludge System of Pulp and Paper's Mill Wastewater Treatment

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Abstrak

The organic complex compound contained in pulp and paper's mill wastewater such as lignin and cellulose is difficult to be degraded, that causes low biodegradability of aerobic microorganism in high organic loading rate actinated sludge system. Xylanase and cellulase aplication experiment on activated sludge system process had taken in batch process, aimed to enchance organic complex com[pound's biodegradation effectivity. The experiment used a combination of pulping's wastewater (black liquor) and paper's mill waste to have COD+1500 mg/L. The treatment variations are: activated sludge concentrations (MLSS), enzyme dosages, and residence time. Activated sludge concentrations are MLSS 0, 2000, and 4000 mg/L, xylanase and cellulase's dosages are control, 50 and 100 ppm. and residence time are 12, 18, and 24 hours. This experiment yield highest COD reduction of 35,55% in activated sludge with 50 ppm xylanase application, where 50,96% reached with 100 ppm cellulase application, both occurred in MLSS 2000 mg/L and residence time 24 hours. Compared with control whose only reached COD reduction of 31,12 %, xylanase enchanced the reduction 4,43 % when cellulase enhanced 19,84%.