Effect of organic loading and nitrogen concentration on the efficiency of the sequencing batch reactor (SBR) system with electroplating wastewater (EPWW) / Suntud Sirianuntapiboon, Kanidta Chairattanawan

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Abstrak

ABSTRAK
The study was concerned with the effects of the organic loading as food/microbe (F/M) and nitrogen concentration as BOD5: TN on the sequencing batch reactor (SBR) system efficiency and performance with 1:5 diluted-electroplating wastewater (EPWW) solutions. The results showed that chemical oxygen demand (COD) and biological oxygen demand (BOD5) removal efficiencies were almost the same with the organic loadings of 0.125-0.375 kg BOD5/m3.d. The CN- and Zn2+ loadings of 1.2-2.9 and 1.6-4.0 g/m3.d did not show strong repression effects to the COD and BOD5 removal efficiencies. In addition, the high Zn2+ removal efficiency level of 94-96% was detected. Moreover, the system did not show any difference in Zn2+ and COD removal efficiencies at the BOD5: TN ratios of 100:5-100:10. Urea and (NH4)2SO4 could be used as the nitrogen source of 1:5 diluted-electroplating wastewater solution. The highest COD, BOD5, Zn2+, CN-, Total Kjeldahl nitrogen (TKN) and total nitrogen (TN) removal efficiencies of 98.0±0.2, 97.0±0.7, 97.7±0.1, 93.3±1.2, 86.5±1.1 and 80.9±0.5%, respectively, were detected at the BOD5:TN ratio of 100:10 and (NH4)2SO4 was used as the nitrogen source. The system also showed good bio-sludge performance with the Sludge Volume Index (SVI) and Sludge Retention Time (SRT) values of 51±4 mL/g and 29±3 days, respectively.