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Perbandingan kerja sistem ipal domestik dengan aerated submerged fixed film reactor dan bio kleen sewage system di PT. GS Battery, Sunter = Comparison of domestic wastewater treatment plant using aerated submerged fixed film reactor and bio kleen sewage system in PT. GS Battery, Sunter

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Abstrak

Pengolahan air limbah domestik PT GS Battery dengan Bio Kleen Sewage System masih menghasilkan konsentrasi amonia effluen yang melebihi baku mutu. Aerated Submerged Fixed Film Reactor yang diketahui mampu mengolah beban amonia tinggi, diterapkan untuk mengolah air limbah tersebut dan dievaluasi selama 45 hari. Penelitian skala laboratorium dilakukan menggunakan bioreaktor dengan kapasitas 5.6 L yang dioperasikan pada waktu detensi yang berbeda, yaitu 6, 8, dan 10 jam. Lumpur aktif resirkulasi dari instalasi pengoalahan air limbah Jababeka digunakan sebagai lumpur pembibitan. Kualitas influen penelitian memiliki laju beban Chemical Oxygen demand COD dari 1181 sampai 1987 g COD m-3 hari-1 dan laju beban analisis dari 134 sampai 223 g NH3-N m-3 hari-1. Hasil penelitian menunjukkan performa yang lebih baik pada HRT 10 jam, dimana sistem mencapai 90 ndash; 93 dan 94 ndash; 99 pada efisiensi penyisihan COD dan analisis. Data yang diperoleh menunjukkan nilai R-kuadrat 0.87 dan 0.85. Konsentrasi effluen COD dan amonia memiliki rentang 36 ndash; 60 mg/L dan 0.4 ndash; 5 mg/L dimana keduanya telah memenuhi standar baku mutu di Indonesia. Penelitian ini juga menunjukkan dua kondisi aerobik dan anaerobik dapat bekerja dalam satu bioreaktor.

.....Domestic wastewater treatment in PT GS Battery using Bio Kleen Sewage System still produced ammonia concentration above effluent discharge standard. Aerated Submerged Fixed Film Reactor which known for its ability to treat high ammonia loading, was used and evaluated during 45 days. Laboratory experiment were conducted using a bioreactor with 5.6 L capacity operated at different hydraulic retention times, which were 6, 8, and 10 hours. Return activated sludge from wastewater treatment plant of Jababeka was taken as seed sludge. The influent of the experiment has Chemical Oxygen Demand COD loading rate from 1181 to 1987 g COD m 3 day 1 and ammonia loading from 134 to 223 g NH3 m 3 day 1. Results indicated better performance at 10 hours rsquo retention time that the system was able to achieve 90 ndash 93 and 94 ndash 99 removal efficiencies of COD and ammonia. Data gained exhibited the R squared value were 0.87 and 0.85. The effluent COD and ammonia concentration ranged between 36 ndash 60 mg L and 0.4 ndash 5 mg L which lower than the Indonesian national discharge standards for both parameters. The present study showed also two conditions of aerobic and anaerobic could be worked in a single bioreactor.