PERBEDAAN KADAR BOD, TSS SEBELUM DAN SESUDAH METODE KOAGULASI, SEDIMENTASI, AERASI DAN FILTRASI PADA LIMBAH CAIR PABRIK TAHU MEKARSARI

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ABSTRAK

Kandungan limbah cair tahu yaitu karbohidrat, protein dan lemak. Menyebakan tingginya bahan organik, kadar BOD, COD, TSS, dan pH. Sehingga limbah cair tahu yang langsung dibuang ke sungai tanpa proses pengolahan yang baik akan menimbulkan bau tidak sedap, warna air gelap dan keruh menyebabkan gangguan kehidupan biotik dalam air, dan oksigen dalam air menurun. Mengatasi tingginya BOD dan COD dilakukan penambahan oksigen dalam air agar terpenuhinya oksigen organisme perairan. Kadar TSS diturunkan dengan memisahkan zat padat dari zat cair menggunakan media berpori untuk mengurangi bau, rasa dan warna. Tujuan dari penelitian ini mengetahui perbedaan kadar BOD, TSS sebelum dan sesudah metode koagulasi, sedimentasi, aerasi dan filtrasi pada limbah cair Pabrik Tahu Mekarsari.

Jenis penelitian *pra eksperimen* dan menggunakan desain penelitian *one group pretest-postest only design*. Sampel diambil dengan teknik *grab sample* sebanyak 32 liter. Metode koagulasi menggunakan koagulan *Poly Aluminium Chloride*. Sedimentasi selama 30 menit. Aerasi 240 menit menggunakan bubble aerator. Filtrasi dengan media pasir, ijuk dan kerikil. Analisis data uji *paired t-test* sebelum dan sesudah perlakuan pada kadar BOD maupun kadar TSS.

Hasil penelitian kadar BOD terjadi penurunan 67,19 mg/l (41,70%) dan kadar TSS sebesar 90 mg/l (31,99%). Hasil analisis uji paired t-test *2-tailed P*(0,000) < α(0,05) kadar BOD dan kadar TSS yaitu ada perbedaan kadar BOD dan TSS sebelum dan sesudah metode koagulasi, sedimentasi, aerasi dan filtrasi pada limbah cair Pabrik Tahu Mekarsari. Saran peneliti lain dilanjutkan pada proses awal dengan penambahan bar screen, waktu proses sedimentasi, penggunaan spesifikasi aerator yang berbeda namun dengan waktu operasional yang sama, serta penggunaan media filtrasi yang berbeda atau menambah ketebalan media filtrasi.

Kata Kunci : Limbah Cair Tahu, Koagulasi, Aerasi, Sedimentasi, Filtrasi.

DIFFERENCES IN BOD, TSS LEVELS BEFORE AND AFTER COAGULATION, SEDIMENTATION, AERATION AND FILTRATION METHODS IN MEKARSARI TOFU FACTORY LIQUID WASTE

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ABSTRACT

The contents of tofu liquid waste are carbohydrates, protein and fat. Causes high organic matter, BOD, COD, TSS and pH levels. So that liquid tofu waste that is thrown directly into the river without proper processing will cause an unpleasant odor, the water color will be dark and cloudy, causing disruption to biotic life in the water, and oxygen in the water will decrease. To overcome high BOD and COD, add oxygen to the water to ensure oxygen supply for aquatic organisms. TSS levels are reduced by separating solid substances from liquid substances using porous media to reduce odor, taste and color. The aim of this research is to determine the differences in BOD, TSS levels before and after the coagulation, sedimentation, aeration and filtration methods in Mekarsari Tofu Factory liquid waste.

This type of research is pre-experimental and uses a one group pretest-posttest only design research design. Samples were taken using the grab sample technique of 80 liters. The coagulation method uses Poly Aluminum Chloride coagulant. Sediment for 30 minutes. 240 minutes of aeration using a bubble aerator. Filtration with sand, fiber and gravel media. Analysis of paired t-test data before and after treatment on BOD levels and TSS levels.

The results of the research showed that BOD levels decreased by 67.19 mg/l (41.70%) and TSS levels by 90 mg/l (31.99%). The results of the analysis of the paired t-test 2-tailed P(0.000) < α(0.05) BOD levels and TSS levels are that there are differences in BOD and TSS levels before and after the coagulation, sedimentation, aeration and filtration methods in Mekarsari Tofu Factory liquid waste. Other researchers' suggestions continued with the initial process by adding a bar screen, sedimentation process time, using different aerator specifications but with the same operational time, as well as using different filtration media or increasing the thickness of the filtration media.

Keywords : Tofu liquid waste, coagulation, aeration, sedimentation, filtration.