

INTISARI

Industri pencucian jeans mengeluarkan limbah cair dengan parameter COD, BOD, dan TSS cukup tinggi. Hal ini menimbulkan masalah yang serius bagi lingkungan bila dibuang langsung ke badan air tanpa melalui pengolahan. Untuk menangani permasalahan tersebut dilakukan eksperimen proses elektrokoagulasi skala laboratorium memakai elektroda besi. Proses elektrokoagulasi memakai elektroda besi menghasilkan hidroksida besi dalam larutan yang secara kimia bereaksi dengan kotoran yang menghasilkan lumpur yang dapat langsung dibuang.

Tujuan utama penelitian ini adalah untuk mengetahui kadar COD, BOD, dan TSS limbah cair industri pencucian jeans sebelum dan sesudah dilakukan proses elektrokoagulasi, serta mengetahui efisiensi penurunan kadar COD, BOD, dan TSS setelah proses elektrokoagulasi sebagai alternatif pengolahan limbah cair industri pencucian jeans.

Penelitian ini termasuk penelitian eksperimen murni dengan rancangan *pretest and posttest with control group*. Populasi dalam penelitian ini adalah limbah cair industri pencucian jeans CV. EMAGO Pekalongan dan sampel diambil berdasarkan kebutuhan (*quota sampling*). Proses elektrokoagulasi dengan memvariasikan jarak elektroda dan tegangan listrik DC, dan proses elektrokoagulasi dilakukan masing-masing selama 10 menit, 20 menit, 30 menit, 40 menit, 50 menit, dan 60 menit.

Dari penelitian ini didapatkan hasil penurunan kadar COD optimum sebesar 84,87 % terjadi pada jarak elektroda 2 cm, tegangan listrik DC 15 Volt dan waktu kontak elektrokoagulasi optimum 50 menit. Penurunan kadar BOD₅ optimum sebesar 84,86 % terjadi pada variasi jarak elektroda 2 cm, tegangan listrik DC 15 Volt dan waktu kontak elektrokoagulasi optimum 50 menit, sedangkan penurunan kadar TSS optimum sebesar 81,45 % terjadi pada variasi jarak elektroda 3 cm dan tegangan listrik DC 15 Volt serta waktu kontak elektrokoagulasi optimum 50 menit.

Kata kunci : limbah cair laundry jeans, elektrokoagulasi, *Chemical Oxygen Demand* (COD), *Biological Oxygen Demand* (BOD), *Total Suspended Solids* (TSS).

ABSTRACT

Jeans laundry industry produces liquid waste with relatively high COD, BOD and TSS parameter. Its will raice a serious problems for the environment if the waste is directly disposed to the river without treatment. To overcome the problem it is necessary to do an experiment of electrocoagulation process in the laboratory using iron electrode. This process produces iron hydroxide in solution which chemically reacts with solution producing mud which its can be disposed directly.

The objective of the study was to identify the level of COD, BOD and TSS of jeans laundry industrial liquid waste before and after electrocoagulation process, and find out the efficiency of COD, BOD and TSS level reduction after electrocoagulation process as an alternative of jeans laundry industrial liquid waste processing.

The study was an experiment that used pre-test and post-test with control group design. Subject of the study was industrial liquid waste of CV. EMAGO jeans laundry at Pekalongan and samples were taken as needed (quota sampling). Electrocoagulation process was done by making variations of distance of electrode and DC electrical voltage. The process was carried out within 10, 20, 30, 40, 50 and 60 minutes.

The result of the study showed that reduction of optimum COD level was 84.87% which occurred to electrode at 2 cm distance, DC 15 Voltage and duration of optimum electrocoagulation contact for 50 minutes. Reduction of optimum BOD, level was 84.86% which occurred to electrode at 2 cm distance, DC 15 voltage and duration of optimum electrocoagulation contact for 50 minutes, whereas reduction of optimum TSS level was 81,45 % which occurred to electrode at 3 cm distance, DC 15 voltage and duration of optimum electrocoagulation for 50 minutes.

Keywords : liquid waste of jeans laundry, electrocoagulation, Chemical Oxygen Demand (COD), Biological Oxygen Demand (BOD), Total Suspended Solids (TSS).