

**PENGARUH PENAMBAHAN ASAM OKSALAT PADA PROSES
FENTON TERHADAP PENURUNAN KONSENTRASI SURFAKTAN
ANIONIK DALAM AIR LIMBAH *LAUNDRY***

Dwi Anitasari

17/409463/PA/17770

INTISARI

Dalam penelitian ini telah dikaji pengaruh penambahan asam oksalat ($\text{H}_2\text{C}_2\text{O}_4$) terhadap penurunan konsentrasi surfaktan anionik alkil benzena sulfonat (ABS) dalam air limbah *laundry*. Proses Fenton dengan oksalat pada limbah dilakukan dengan mereaksikan limbah dengan Fe^{2+} , H_2O_2 dan $\text{H}_2\text{C}_2\text{O}_4$. Dalam proses Fenton dipelajari pengaruh konsentrasi $\text{H}_2\text{C}_2\text{O}_4$, pH dan waktu reaksi. Pengaruh konsentrasi $\text{H}_2\text{C}_2\text{O}_4$ dipelajari dengan cara memvariasikan konsentrasi yaitu 0, 2, 4, 6, 8, dan 10 mM. Proses Fenton dilakukan dengan variasi pH yaitu 3, 5, 6, 7, 8, 9, dan 11 serta variasi waktu yaitu 0, 5, 15, 30, 45, 60, 90, dan 120 menit.

Hasil penelitian menunjukkan bahwa konsentrasi surfaktan anionik di dalam limbah sebesar 136 mg/L. Proses Fenton terhadap 10 mL limbah dengan pereaksi Fe^{2+} 5 mM dan H_2O_2 25 mM mampu menurunkan konsentrasi ABS hingga 99% pada kondisi optimum, yaitu penambahan $\text{H}_2\text{C}_2\text{O}_4$ dengan konsentrasi 6 mM dan pH 7 dengan waktu reaksi selama 90 menit. Penerapan Fenton dengan pengompleks $\text{H}_2\text{C}_2\text{O}_4$ meningkatkan efektivitas degradasi surfaktan anionik pada pH netral (pH 7) dibandingkan Fenton tanpa pengompleks yang efektif pada pH asam (pH 3). Penurunan konsentrasi ABS hingga memenuhi baku mutu yang ditetapkan pemerintah yaitu 3 mg/L tercapai dengan satu tahap Fenton dengan konsentrasi akhir surfaktan anionik sebesar 1,15 mg/L.

Kata kunci : Fenton, $\text{H}_2\text{C}_2\text{O}_4$, H_2O_2 , Fe^{2+} , surfaktan

***EFFECT OF OXALIC ACID IN THE FENTON PROCESS ON THE
DECREASE OF ANIONIC SURFACTANT CONCETRATION
IN LAUNDRY WASTEWATER***

Dwi Anitasari

17/409463/PA/17770

ABSTRACT

In this research, effect of oxalic acid in the Fenton process on the decreasing anionic surfactant alkyl benzene sulfonate (ABS) concentration of waste water has been studied. The Fenton process was carried out by reacting waste water with Fe^{2+} , H_2O_2 , and $\text{H}_2\text{C}_2\text{O}_4$. Effect of $\text{H}_2\text{C}_2\text{O}_4$ concentration, pH and reaction time in the Fenton process has been examined. The effect of $\text{H}_2\text{C}_2\text{O}_4$ concentration was examined by varying $\text{H}_2\text{C}_2\text{O}_4$ concentration of 2, 4, 6, 8 and 10 mM at varying pH 3, 5, 6, 7, 8, 9 and 11. The influence of reaction time was examined by varying reaction time of 5, 15, 30, 45, 60, 90 and 120 minutes.

The research results show that concentration of aionic surfactant in laundry waste water was 136 mg/L. Fenton process could decrease anionic surfactant concentration up to 99% at the optimum condition, with $\text{H}_2\text{C}_2\text{O}_4$ concentration of 6 mM and pH 7 with 90 minutes contact time. Fenton process with $\text{H}_2\text{C}_2\text{O}_4$ as complexing agent at pH 7, could decrease anionic surfactant concentration of waste water more effective than Fenton process without complexing agent more at pH 3. The concentration of ABS can be decreased below the standard level of regulated by Government regulation using 1 step Fenton process with final ABS concentration of 1,15 mg/L.

Keywords: Fenton, $\text{H}_2\text{C}_2\text{O}_4$, H_2O_2 , Fe^{2+} , surfactant