

The Role of Electrolytes in Improving Electrocoagulation Performance of Ciprofloxacin Pollutants Removal and Hydrogen Production

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Abstract. During the present pandemic, liquid waste discharged from hospitals is an issue that should be resolved urgently. As one of the most prevalent antibiotics in wastewater, ciprofloxacin was treated using electrocoagulation. This process that uses electrochemical principles can remove dissolved components and is capable of producing hydrogen as an alternative energy source. In this study, the performance of the electrocoagulation process was improved by using NaCl as the electrolyte. Concentrations of 0.2 gr/l and 0.5 gr/l were used to represent the effect of the presence of NaCl in the process. The waste solution's acidity level expressed by pH was also observed for its effect on process performance. The result shows that using 0.2 g/l NaCl provides a significant hydrogen gas production capability. The condition for ciprofloxacin removal, which was not significantly affected by the presence of NaCl, was due to the different characteristics of the coagulant formed at each electrolyte concentration. At pH 5 and NaCl concentration of 0.2 g/l, the process performance was outstanding in removing ciprofloxacin compared to pH 10. The much lower amount of coagulant at pH 5 did not indicate that the removal ability was not superior to pH 10, which resulted in a significantly greater amount. This condition confirms the effect of the characteristics of the coagulant formed in each process on the electrocoagulation performance



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