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Combined sedimentation, electrocoagulation and ozone processes for the wastewater treatment in an Ecuadorian MDF industry

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Abstract

The combination of sedimentation, electrocoagulation (EC) and ozonation processes was investigated to treat wastewater from a medium-density fiberboard panel industry. The set-up of the EC process was composed of aluminum anodes and iron cathodes. For the sedimentation, the residence time was studied in a range from 5 to 120 min, achieving 80% suspended solids removal at 60 min. Three current densities have been investigated for EC: 57.1, 128.6 and 214.3 A/m². The addition of 20 mL/min of polyamide (100 mg/L) was also tested using 200 mL/min of wastewater at an initial pH of 7.5 in order to analyze its effect on the pollutant removal, and therefore, on EC performance. The best operating EC conditions were 214.3 A/m² of current density by the addition of polyamide aqueous solution. After EC, chemical oxygen demand (COD), color and turbidity removals of 66.3%, 99.7% and 99.9%, respectively, were obtained. For the ozonation process, an ozone flow of 2.5 g/h was fed to the wastewater, at an initial pH of 7.4. The effect of various ozone doses on COD, color and

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