

Electrolytic treatment of latex wastewater

ABSTRACT

A novel method of latex wastewater treatment was developed based on in-situ hypochlorous acid generation. The hypochlorous acid was generated in an undivided electrolytic cell consisting of two sets of graphite as anode and stainless sheets as cathode. The generated hypochlorous acid served as an oxidizing agent to destroy the organic present in the latex wastewater. For an influent COD concentration of 3,820 mg/L at an initial pH 4.5; current density of 74.5 mA/cm²; sodium chloride content 3% and electrolysis period of 90 min, resulted in the following residual concentration pH 7.3; COD 78 mg/L; BOD₅ 55 mg/L; TOC 45 mg/L; residual total chlorine 136 mg/L; turbidity 17 NTU and temperature 54°C, respectively. In the case of 2% sodium chloride content for the above, said operating condition resulted in a residual concentration of pH 7; COD 162 mg/L; BOD₅ 105 mg/L; TOC 90 mg/L; residual total chlorine 122 mg/L; turbidity 26 NTU and temperature 60°C respectively. The energy requirements were found to be 35 and 50 Wh/L while treating 24 L of latex wastewater at 3 and 2% sodium chloride concentration at a current density 74.5 mA/cm². The observed energy difference was due to the improved conductivity at high sodium chloride content.

Keyword: Electrolytic treatment; Latex wastewater; Hypochlorous acid; Chlorine; Rubber wastewater; Electrochemical treatment