OPTIMIZATION STUDY OF ELECTROCOAGULATION PROCESS ON NOZI BATIK WASTEWATER

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ABSTRACT

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Batik industry is one of the most well-known industries in clothing and apparel which becomes a source of income in some countries. However, the rapid growth of batik industry also contributes to environmental pollution where untreated effluent was discarded through rivers. The batik effluent has high concentration makes the electrocoagulation process is one of the suitable methods for wastewater treatment. However, electrocoagulation process has not being study well for the degradation of batik wastewater. In this study, Nozi Batik wastewater with a peak max detected at 526 nm was treated under electrocoagulation process by using aluminum as electrode. The decolorization factor of treated wastewater was determine based on the absorbance value detected via visible spectrophotometer. The optimum condition parameters of electrocoagulation process for Nozi batik wastewater treatment were determined where the electrolyte used (NaCl), electrode distance, and voltage were detected at 10 ppm, 1 cm and 22V respectively. This optimum condition under electrocoagulation is more efficient than the conventional method by using alum where it is completely decolorized Nozi wastewater (97% decolorized) for just 6 minutes with comparison to a conventional wastewater treatment method where it reduces 41% at same treatment time. Al ions was detected as the highest composition in treated wastewater detected under ICP-OES due to the excessive production from Al electrodes. However, it may reduce by controlling the electrocoagulation treatment time.

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CHAPTER 1

INTRODUCTION

1.1 Background of Study

Batik industry is one of the most well-known industries in clothing and apparel which becomes a source of income in some countries. This industry had brought huge advantages to the country, especially in the growth of the economy as it is one of the reliable export commodities. The rapid growth of batik industry in Malaysia has caused environmental problems from the dyes used in manufacturing and wastewater disposal (Sulthonuddin & Herdiansyah, 2021). The Environmental Quality Regulation (1974) governing industrial effluent also has lack of awareness, as evidenced by batik entrepreneurs' poor compliance with the act as compared to other manufacturing businesses. Textile or batik manufacturers use a number of chemicals, such as synthetic dyes, wax and other chemical reagents that dependent on the nature of the raw materials. The chemical compositions can be from inorganic to organic compounds (Subki, 2017). However, these wide ranges of chemical in textile industry will be incorporated as wastewater and leads to environmental pollution if it is release without proper treatment process (Subki, 2017).