THE OPTIMIZATION STUDY OF ELECTROCOAGULATION PROCESS ON SLAUGHTERHOUSE WASTEWATER

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ABSTRACT

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A chicken slaughterhouse needs plenty of water to clean up the blood, feathers, and other waste products produced during the manufacturing of processed chicken. Therefore, chicken slaughterhouse wastewater discharged is suffered with certain unfavourable effects as a result of this sequence's constant repetition. Since the beneficial of electrocoagulation (EC) to the environment has being reported, many researchers have suggested EC system to be used in wastewater treatment prior discharged. However, less study was conducted on the EC of slaughterhouse wastewater for local Malaysian Industries. In this study, wastewater from a chicken slaughterhouse located in Alor Setar, Kedah was treated by using an EC process. The absorbance value, dissolved oxygen (DO) and chemical oxygen demand (COD) of the sample during EC under various conditions, including different electrode types, varying voltage levels, different treatment time, and distance between electrode was observed in this study. It was observed that the wastewater having absorbance wavelength with maximum peak of 345 nm detected by UV-Vis spectrophotometer analysis. The optimum condition for EC treatment was under Zn-Zn electrode set, 24 V, 6 min operating time and distance between electrode at 1 cm denoted as (a) conditional parameter, where the percent removal and COD removal of this parameter condition has shown the highest value (81.48% and 91.30% respectively) as compared with others. The composition and concentration of elements was detected by using ICP-OES for all samples.

TABLE OF CONTENT

CHAPTER 1

INTRODUCTION

1.1   Background of study

The decreasing of fresh water becomes a world issue as it ranks fourth place by the World Economic Forum due to its effect towards the society till nowadays (Tahreen, 2020). Human and ecosystem are not the only one affected by the decreasing source of available fresh water, but it even gives impact to the world economy (World Economic Forum, 2019). Moreover, the United Nation (UN) have realised issue regarding fresh water crisis as it be their sixth goal under Sustainable Development Goals movement to achieved by 2030 (Synthesis Report, 2018). It is proven that the rapid growth of urbanisation and industries mostly help to improve the global economy. Nevertheless, the improper ways to handle waste and poor waste treatment by human act as them ignore the environment condition will burden the world economy and also contribute to the fall of ecosystem sustainability by effecting the climate change (Tahreen , 2020).

It is a constant challenge to provide most of the population on earth with a clean water in 21st century (Smalley, 2004). This is because most of the river has been contaminated with effluent from industrial wastewater such as slaughterhouse, dairy, food processing unit and pharmaceutical which is have a high number of impurities and can lead to dangerous effect to human health