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COAGULATION-FLOCCULATION AS PRE-TREATMENT FOR RUBBER GLOVE WASTEWATER RECLAMATION SYSTEM

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ABSTRACT

In this work, the rubber glove effluent was treated by using coagulation-flocculation method. Two different types of coagulant, i.e polyaluminium chloride (PAC) and ferric chloride (FC) were used in jar test. The wastewater was initially characterized in terms of pH, ammonical nitrogen (AN), chemical oxygen demand (COD), nitrate, total suspended solids (TSS), turbidity, total dissolved solids (TDS) and trace elements by using standard method. In jar test, COD and turbidity removal efficiency was used as performance indicator for the coagulation-flocculation process. Three parameters were carried out in jar test i.e pH (6-10), coagulants dosages (100- 500 mg/L) and flocculants dosages (1-5 mg/L). The optimum coagulation-flocculation conditions for FC were pH 9, 400 mg/L coagulant dosage and 1 mg/L flocculants dosage with COD removal efficiency within 63 % to 88%. As for PAC, the optimum conditions achieved at pH 7.5, 400 mg/L coagulant dosage and 5 mg/L flocculants dosage with COD removal efficiency 38% to 98%. Overall, PAC shows greater turbidity removal efficiency up to 98% as compared to FC (94%). In conclusion, coagulant-flocculants could be used as an effective ways to reduce the turbidity and chemical oxygen demand (COD) level for rubber glove effluent.

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CHAPTER 1

INTRODUCTION

1.1 RESEARCH BACKGROUND

The rise of the rubber sector in Malaysia can develop a horrendous environmental demolition as the amount of high-rise wastewater manufacture even though it is pony-up to the Malaysia's important economic development (P.S. Yap et al., 2013). Without the right remedy for these problems, the removal of rubber gloves wastewater to our surroundings might also lead to utmost and extend outcomes (Ramanan and Vijayan , 2015). For that reasons, appropriate technology need to be applied in order to treat the rubber glove wastewater (Yassin, 2008). Wastewater from rubber gloves industry should be handling by treating the wastewater, hence, they can adhere to the environmental acts and regulations stated by Department of Environment (DOE) of Malaysia before the wastewater released into the river as it may contain hazardous contaminants that can harm humans (Sastry et al., 2000).

Latex wastewater contains high suspended solids (latex residues), high organic matter and nitrogen containing pollutants, high acidity and strong odors (Bal Krishna et al., 2016). The remaining water containing latex is treated in various ways. The aerated lagoon, anaerobic-cum-aerated lagoon, anaerobic-cum-facultative lagoon and trench oxidation system are examples of biological treatment systems (N.H. Rosman et al., 2014). It has been used conventionally for latex wastewater treatment (Vijayaraghavan et