COLOR REMOVAL FROM TREATED PALM OIL MILL EFFLUENT (TPOME) BY ADSORPTION ON SUGARCANE BAGASSE

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ABSTRACT

COLOR REMOVAL FROM TREATED PALM OIL MILL EFFLUENT BY ADSORPTION ON SUGARCANE BAGASSE

Malaysia is one of the largest producers and exporter of palm oil. As a result, a large volume of palm oil mill wastewater (POME) is also produced. POME is normally treated by the ponding method but the treated POME (TPOME) is still dark grey in color. When TPOME is discharged into water ways, the colored compounds in TPOME cause the water to become aesthetically displeasing and also inhibit sunlight penetration into the stream, hence affecting aquatic ecosystem. The use of cheap and eco-friendly adsorbent has been studied as an alternative substitute of activated carbon for the color removal from TPOME. This study aims to assess the potential of sugarcane bagasse, pretreated with sulphuric acid and phosphoric acid, for the removal color from TPOME. The effects of various experimental parameters such as pH of wastewater, contact time and adsorbent dosage were investigated. The results in this study indicated that, phosphoric acid-treated sugarcane bagasse has higher efficiency in color removal of TPOME compared to sulphuric acid-treated sugarcane bagasse at all pH. The highest percentage of color removal is 93.6%. The corresponding reduction of COD was 85.2%. The optimum contact time is 180 minutes and a lower dosage of phosphoric acid-treated bagasse was utilized. However, the final absolute values of the color and COD are still higher than the DOE discharge limits. Therefore, it is recommended that further study of the pretreatment process of bagasse be carried out so that the adsorption efficiency can be further increased.