UNIVERSITI TEKNOLOGI MARA

TREATMENT OF CLOSED SANITARY LANDFILL LEACHATE USING BIOCHAR DERIVED FROM SOLID HYDRODISTILLATION WASTE OF AGARWOOD

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ABSTRACT

Biochar is derived from biomass, and its characteristic in wastewater treatment has been the subject of many studies. In Malaysia, adsorbent in the form of biochar has been produced from various local agricultural wastes. The thermal treatment during carbonization process causes the changes in structure properties which lead to high reactivity hence making the biochar suitable to be used as an adsorbent. In accordance to that, the main idea of this study is to develop biochar adsorbent from solid agarwood waste obtained after the extraction process - hydro distillation. The production of agarwood oil will yields a lot of wood mass after the extraction process. The outstanding ability of water adsorption of agarwood and additionally with the abundant availability of sources, agarwood waste is promising material to be developed into adsorbent and study is carried out to investigate the efficiency to treat leachate. It was found that pH Adjustment will reduce the turbidity of leachate, and the best result (lowest turbidity) obtained from the study is when leachate being adjusted to pH 5. By standardizing the initial pH, the dosing tests were conducted at pH 5. Biochar produced at 600^0C yielded the highest BET surface area and highest total pore volume. The surface area can be enhanced 10 times greater than when agarwood waste was washed with strong acid and carbonized at 500^0C as compared to untreated biochar. Surface area and total pore volume affect dissolved oxygen rate. Higher surface area and total pore volume give lower value of dissolved oxygen rate in weak alkaline condition. The research suggested that acid washing enhance the efficiency of treatment by increasing the surface area of biochar produced. It is hope that in the future, the study can be further develop and apply in wastewater and sewage treatment management in Malaysia.

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