STATIC AND DYNAMICS OF MERCURY ADSORPTION PERFORMANCE EVALUATION USING RICE STRAW BASED BIOSORBENTS

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A thesis submitted in fulfillment of the requirements for the award of the degree of Bachelor of Engineering (Chemical)

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JANUARY 2013
ABSTRACT

Mercury (Hg) is one of the most hazardous and harmful pollutants that released into the environment. Mercury and most of its compounds are extremely toxic to both human and the environment even in relatively low concentrations. Several methods such as sulphide precipitation, coagulation and ion-exchange have been used for their removal but have been found to have only limited application. Currently, adsorption is viewed as one of the easiest, safest and most cost-effective physic-chemical treatment process in removing heavy metal from aqueous solutions and it has been widely used in effluent treatment process. Considerable attention has been focused in recent years upon the field of biosorption for the removal of heavy metal ions from aqueous effluents. In this study, biosorption using rice straw (one of the rice residues) was focused on the removing of mercury form aqueous solution. The purpose of this study was to evaluate the performance of adsorption using rice straw in batch mode and continuous mode analysis. Rice straws were undergone modification of grafting with organosilane. Biosorption of Hg (II) onto rice straw was fitted to Langmuir isotherm model. For batch mode analysis, two parameters which are initial concentration and pH were evaluated whereas for column analysis, parameters such as bed depth, initial feed concentration and flow rate were evaluated to study on the performance of the biosorption process. It was found that the breakthrough time increase with increase in the bed depth, but decrease on increasing the flow rate and initial concentration of the liquid. In conclusion, the biosorption capacities of grafted rice straw (GRS) is better than raw rice straw (RRS).
ABSTRAK

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