

**APPLICATION OF BAGASSE AND COIR AS SORBENT DUST FOR HEAVY
METAL AND DYE REMEDIATION FROM AQUEOUS SOLUTION**



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2. Sukacita dimaklumkan pihak Universiti telah meluluskan cadangan penyelidikan Y Brs Profesor/tuan/puan untuk merobiayai projek penyelidikan di bawah *Dana* Kecemerlangan UiTM.

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4. Peruntukan kewangan akan disalurkan melalui tiga (3) peringkat berdasarkan kepada laporan kemajuan serta *kewangan* yang mencapai perbelanjaan lebih kurang 50% dari peruntukan yang diterima.

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5. Untuk tujuan mengemaskini, pihak Y. Brs. Profesor/tuan/puan adalah diminta untuk melengkapkan semula kertas cadangan penyelidikan berdasarkan borang penilaian yang diiampirkan, mengisi borang setuju terma projek penyelidikan dan menyusun perancangan semula bajet yang baru seperti yang diuiuskan Sila lihat lampiran bagi tatacara tambahan untuk pengurusan projek

Sekian, harap maklum.

"SELAMAT MENJALANKAN PENYELIDIKAN DENGAN JAYANYA"

Yaiag benar

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5. Report

5.1 Proposed Executive Summary

Contaminations of wastewater with heavy metals ions have created a major global concern due to their toxicity. Heavy metal ions are considered as persistent environmental contaminants since it cannot be degraded and destroyed thus causing various disease and disorder. Adsorption by activated carbon is one of the methods found to be effective in removing heavy metals from aqueous solution. However the application of activated carbon for wastewater treatment is not feasible due to its high price and cost associated with the regeneration. The uses of agricultural waste as adsorbent have been widely investigated to replace the costly activated carbon. Most of the adsorption studies have focused on chemically or physically treated agricultural waste. Treatment of agricultural waste can extract soluble organic compound and enhance chelating efficiency. Although chemically modified plant wastes can enhance the adsorption capacity, the cost of chemicals used and methods of modification will increase the cost of the adsorbent. Beside it can also alter the surface properties of the adsorbent. In this study unmodified and modified bagasse and coir will be used as sorbent dust for the remediation of Cd(II) in aqueous solution by using batch adsorption. The remediation efficiencies of these unmodified and modified bagasse and coir will be compared with the activated carbon (AC).

5.3 Introduction

Dyes, pigments and heavy metals represent common and dangerous pollutants, originating in large quantities from dye manufacturing, textile as well as pulp and paper industries. They are emitted into wastewaters and produce difficult to treat water contamination, as the colour tends to persist even after the conventional removal processes [1,2]. The conventional techniques used for dyes and heavy metal removals are expensive, have average efficiency and are running in sequential steps. For example, on the commercial scale the ion-exchangers and activated carbons are used, however, with certain disadvantages. The activated carbon is a great adsorbent for dyes but de-sorption and regeneration is difficult under common conditions and the overall process becomes expensive. Moreover, its efficiency in heavy metals removal is average [3,4,5].

Removal of heavy metals and dyes using agricultural waste has been massively investigated due to the abundance of agricultural-related material and its low cost [6,7,8,9]. Various investigated agricultural waste include rice husk ash [10], sunflower stalks [11], sago waste [12] and papaya wood [13]. In this study, bagasse and coir has been chosen as the adsorbent for heavy metal (Cd(II)) and dyes (methylene and congo red) removal.