

Biotechnologies towards Sustainable Development in Malaysia

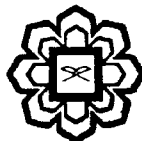
Zarina Zainuddin

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Zarina Zainuddin



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Chapter 20

Bioadsorption of heavy metals from synthetic waste water by tropical rambutan seed

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Introduction

Heavy metals in other way, are toxic inorganic contaminants that, unlike organic contaminants that can be degraded by microorganisms, must be removed from wastewater before being discharged to the environment. A wide range of physical and chemical processes are available for the removal of heavy metal ions during wastewater treatment. These include ion-exchange, electro-chemical precipitation, filtration and adsorption on activated carbon. Ion exchange and adsorption on activated carbon are efficient treatments but they are not largely used due to their high operational costs. Alternatively, aquatic plant materials have shown a remarkably high adsorption capacity for heavy metals from water (Ajmal *et al.*, 2000; Kadirvelu *et al.*, 2000; Olivera *et al.*, 2004; Wase and Forster, 1997), as well as from regular aqueous solutions of the ions. Selection of a treatment process is dependent on the nature of the wastewater and the quality of the effluent desired. Adsorption is a physico-chemical process that generally occurs at the interface of fluid-solid phases and is sometimes used to remove certain species that cannot effectively be removed from the wastewater stream by other conventional technologies (Liu,