Adsorption of Zinc from Waste Water Using Bladderwort (*Utricularia vulgaris*)

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ABSTRACT

Environmental issues in Malaysia such as water pollution have increased rapidly due to the country's development and its movement towards globalization. Amongst these developments are the expansions of industrial and manufacturing sectors in the country. Several of these industrial sectors have discharged heavy metals to open rivers. As such, surface water sources are being depleted and limited due to polluted rivers and thus cannot be used for water consumption. Despite advanced pollution control techniques, heavy metals still could find their ways particularly through waste water discharge or leachate of solid waste. Hence, with increasing environmental awareness and government policies, it has become necessary to develop new environmental friendly techniques to reduce the contaminants using low cost methods and materials. The main techniques developed to remove heavy metals from water include chemical precipitation, membrane filtration, ion exchange and adsorption. In this research, Bladderwort (Utricularia vulgaris) is introduced as an adsorbent material for zinc (Zn). Bladderwort is an aquatic lake plant found to be cost effective and economical as it can be found in most lakes. For the purpose of this study, Bladderwort was collected from paddy field (Oryza sativa L.) around Permatang Pauh, Pulau Pinang. The aquatic plant collected must be treated before it undergoes sieve analysis in order to get the different size of Bladderwort. The batch studies were conducted to

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determine the factors affecting adsorption such as the size, pH and agitation speed. The results indicated that zinc removal is efficient at pH 7 and at the size of 150 mm. It is found that the agitation speed also influences the adsorption process with maximum zinc removal of 97.5% occurring at 200 r.p.m. This research indicates that Bladderwort could become one of the natural adsorbents in managing zinc problems from waste water.

Keywords: *Bladderwort, water pollution, waste water, adsorption*