REVIEW ON PERFOMANCE OF NATIVE PLANTS IN REMOVING HEAVY METALS IN WASTEWATER

NURUL AIMAN HAZIQAH BINTI ABDULLAH

FACULTY OF CHEMICAL ENGINEERING
UNIVERSITI TEKNOLOGI MARA JOHOR
PASIR GUDANG CAMPUS

APRIL 2015

ACKNOWLEDGEMENT

In the name of Allah, the Most Gracious and the Most Merciful. Alhamdulillah, all praises to Allah for the strength and his blessing to myself for completing this thesis. Special appreciation goes to my supervisor, Cik Salmi Nur Ain binti Sanusi for her assistant, supervision and constant support during this preparation of this thesis. Her guidance and invaluable help of constructive comments and suggestion that enabled me to develop a detailed understanding towards this research

Sincere thanks to all my group members especially Syazwina binti Azizi that always give me support during completing this final year project. I also want to thanked to my roommate , Nur Farina bt Wazir which always give advice , motivation and sharing her knowledge with me .

Last but not least, I would to express my gratitude to my parents, En Abdullah Kassim and Pn Sarimah Ismail and also my sisters for their endless love, prayers and encouragement. Their supports really give me a lot of strength to finish this thesis. Thank you for all that involve directly or indirectly during finishing this project which contributed to the success of this research.

ABSTRACT

Heavy metals are considered extremely harmful because they can cause illness and diseases to human and environment. Wastewater that discharges from many sources like wastewater from industry can lead to water pollution if untreated especially due to its high concentration of heavy metals. Therefore wastewater containing heavy metals should be treated before discharge to the water stream. This study are focused on identifying potential plants in Malaysia that can remove heavy metals in wastewater and evaluate the performance of various native plants in removing heavy metals in wastewater. There are several methods to remove heavy metals like adsorption, chemical precipitation, reverse osmosis, and ion exchange. However those methods usually are very costly. Therefore this study focused on phytoremediation method which is environmental friendly and economic. The phytoremediation concept is the best technology to be used in order to solve the water pollutant. It is very suitable to apply in developing countries like Malaysia. The methodology in this research is focused on the several experiments that have been done by previous researchers. From the experiment, it can be seen that a few study area in Malaysia with the sample of plants and wastewater that taken in the site. The results show the performance of the plants that use in their experiment which give a good result in removing heavy metals in wastewater.

TABLE OF CONTENTS

			PAGE	
DECLARATION			1	
CERTIFICATION				
ACKNOWLEDGEMENT				
ABSTRACT			v	
TABLE OF CON	TENTS		V1	
LIST OF TABLES				
LIST OF FIGURES				
LIST OF ABBRE	VIATIONS	S	x	
LIST OF SYMBO	LS		X1	
CHAPTER 1	INTRODUCTION			
	1.1	Research Background	1	
	1.2	Problem Statement	2	
	1.3	Objectives of Researches	3	
	1.4	Scopes of Researches	3	
CHAPTER 2	LITERATURE REVIEW			
	2.1	Water Pollution in Malaysia	5	
	2.2	Wastewater	7	
		2.2.1 Wastewater Characteristic	8	
		2.2.2 Effect of wastewater pollutant	10	
	2.3	Heavy Metals	10	
		2.3.1 Type of Heavy Metals	11	
		2.3.2 Effect of Heavy Metals	12	
		2.3.3 Remediation technique to remove	15	
		Heavy Metals in Wastewater.		
	2.4	Phytoremediation	18	
		2.4.1 Introduction	18	
		2.4.2 Phytoremediation Mechanism	18	
		2.4.3 Advantages and disadvantages of	22	
		phytoremediation technique		
	2.5	Plants in Malaysia	23	

CHAPTER 3	METHODOLOGY			
	3.1	Introduction	25	
	3.2	Samples Collecting	25	
	3.3	Laboratory Testing	29	
CHAPTER 4	RESULT AND DISCUSSION			
	4.1	Introduction	32	
	4.2	Effect of Concentration	32	
	4.3	Heavy Metals Removal Efficiency	35	
CHAPTER 5	CONCLUSION AND RECOMMENDATION			
	5.1	Conclusion	40	
	5.2	Recommendation	41	
REFERENCES			42	