

**SYNTHESIS OF
POLYANILINE/ CATECHOL/ ALGINATE BASED
COMPOSITE BEADS FOR REMOVAL OF
HEAVY METAL IONS**

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**BACHELOR OF CHEMICAL ENGINEERING
(ENVIRONMENT) WITH HONOURS**

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BASED COMPOSITE BEADS FOR REMOVAL OF HEAVY
METAL IONS**

By

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TABLE OF CONTENTS

	PAGE
AUTHOR'S DECLARATION	i
SUPERVISOR'S CERTIFICATION	ii
COORDINATOR'S CERTIFICATION	iii
ACKNOWLEDGEMENT	iv
TABLE OF CONTENTS	v
LIST OF TABLES	vii
LIST OF FIGURES	viii
LIST OF PLATES	ix
LIST OF SYMBOLS	x
LIST OF ABBREVIATIONS	xi
ABSTRACT	xii
CHAPTER 1 INTRODUCTION	
1.1 RESEARCH BACKGROUND	1
1.2 PROBLEM STATEMENT	4
1.3 OBJECTIVES	5
1.4 SCOPE OF WORK	6
CHAPTER 2 LITERATURE REVIEW	
2.1 HEAVY METALS	7
2.2 ADSORPTION TECHNOLOGIES	9
2.1.2 Adsorption Isotherms and Kinetics	12
2.3 ADSORBENTS	15
2.3.1 Composite Beads	17
2.4 PHYSICAL AND CHEMICAL PROPERTIES OF SODIUM ALGINATE	18
2.5 CROSS-LINKING METHOD FOR MODIFICATION OF SODIUM ALGINATE BEADS	20
2.6 CHARACTERISTICS OF SURFACE FUNCTIONAL GROUPS	25
CHAPTER 3 RESEARCH METHODOLOGY	
3.1 FLOWCHART	27

ABSTRACT

Lead ion (Pb^{2+}) is known as one of the hazardous pollutants discharged from paint and batteries wastewater industries, which can contribute to toxic pollution, and have serious health effects. Adsorption is a widely used treatment technology because of its versatility and economic feasibility. Because raw Alginate beads have poor chemical stability and adsorption capabilities, the removal of Pb^{2+} was studied using PANI/ Catechol/ Alginate based composite beads at various weight percent of PANI. The FTIR analysis was carried out to identify the presence of organic, inorganic and polymeric components in the composite beads that serve as active sites for the adsorbent. It is suggested that carboxyl and hydroxyl were the major functional groups responsible for the removal of Pb^{2+} . According to the results, 6% PANI/ 2% Catechol/ Alginate based composite beads have the highest efficiency for the removal of Pb^{2+} with 88% removal. The Freundlich multilayer sorption capacity was observed to be 0.81 mg/g. This approach is applicable to both monolayer and multilayer adsorption, and the adsorbates are adsorbed on the adsorbent surface. The experimental data better fitted pseudo-first order than pseudo-second order. Thus, the study implied that PANI/ Catechol/ Alginate based composite beads could be an efficient adsorbent for the removal of Pb^{2+} from wastewater systems.