

**ACCUMULATION OF HEAVY METALS OCCURRENCE IN  
INDUSTRIAL SOILS OF *GEBENG INDUSTRIAL AREA***

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## TABLE OF CONTENTS

	<b>Page</b>
<b>ACKNOWLEDGEMENT</b>	iii
<b>TABLE OF CONTENTS</b>	iv
<b>LIST OF TABLES</b>	vi
<b>LIST OF FIGURES</b>	vii
<b>LIST OF ABBREVIATIONS</b>	viii
<b>ABSTRACT</b>	x
<b>ABSTRAK</b>	xi
<b>CHAPTER 1 INTRODUCTION</b>	
1.1 Soil and Heavy Metals	1
1.2 Problem Statement	4
1.3 Objectives	5
1.4 Significance of Study	5
<b>CHAPTER 2 LITERATURE REVIEW</b>	
2.1 Air Pollution	6
2.2 Soil	7
2.3 Health Effects of Heavy Metals	8
2.4 Comparison of Soil Contamination with Other Cities	10
2.5 Enrichment Factor (EF) and Contamination Factor (CF)	11
<b>CHAPTER 3 METHODOLOGY</b>	
3.1 Materials	15
3.2 Methods	15
3.2.1 Study Area	15
3.2.2 Geology and Hydrology	17
3.2.3 Sample Collection	18
3.2.4 Sample Preparation	20
3.2.5 Calibration Curve	21
3.2.6 Sample Analysis	21
3.2.6.1 Atomic Spectroscopy Analysis	21
3.2.6.2 Contamination Factor (CF)	22
3.2.6.3 Enrichment Factor (EF)	23
<b>CHAPTER 4 RESULTS AND DISCUSSION</b>	
4.1 Calibration Curve	25
4.2 Repeatability and Reproducibility Performance	25
4.3 Validation of the Flame Atomic Absorption Spectrometer Technique	26
4.4 Concentration of Heavy Metals in Soil Samples	27
4.5 Contamination Factor (CF)	31

4.6	Enrichment Factor (EF)	34
<b>CHAPTER 5 CONCLUSION AND RECOMMENDATION</b>		<b>38</b>
<b>CITED REFERENCES</b>		<b>41</b>
<b>APPENDICES</b>		<b>44</b>
<b><i>CURRICULUM VITAE</i></b>		<b>47</b>

## LIST OF TABLES

<b>Table</b>	<b>Caption</b>	<b>Page</b>
2.1	Average metals concentration (mg/kg) in soils from cities of the world	11
2.2	Contamination factors and contamination degree for metals in Gebze soils	12
2.3	Contamination factors and contamination degree for metals in Uttar Pradesh soils	13
3.1	Sample collection coordination	19
3.2	Contamination degrees categories	23
3.3	Enrichment factor categories	24
4.1	Calibration curve for Zn, Ni, Mn and Fe by FAAS	25
4.2	% Recoveries of selected elements in loam soil	27
4.3	Mean concentration (mg/kg) of studied metals in soil samples	28
4.4	Descriptive statistic of heavy metals in soils	31
4.5	Contamination factor	32
4.6	Enrichment factor in soil of Gebeng Industrial Area	36

## **ABSTRACT**

### **ACCUMULATION OF HEAVY METALS OCCURRENCE IN INDUSTRIAL SOILS OF *GEBENG INDUSTRIAL AREA***

The aim of this study was to measure the deposited concentration of Ni, Fe, Mn and Zn in the surface soil around Gebeng Industrial Area (GIA), Kuantan, Pahang. Eight samples were collected from four different directions: north, south, east and west of GIA during the monsoon season from December 2012 to January 2013. All the soils were digested by using aqua regia and the metals concentration in soils were analysed by using Flame Atomic Absorption Spectrometer (FAAS). The mean concentrations of heavy metals in soils obtained were: Zn has the value of 41.4 mg/kg, 13.4 mg/kg for Ni, 69.2 mg/kg for Mn and 39,685.4 mg/kg for Fe and were ranked as follow: Fe > Mn > Zn > Ni. Two different parameters were used to describe the contamination of these metals in the soil: Contamination Factor (CF) and Enrichment Factor (EF). Based on the four directions for CF, it is suggested that mostly the soils in these areas were in the categories of no or suspected contamination and none of the area has the extreme contamination level of heavy metals in the soil. A factor that leads to the differences CF values among these sites is the type of soil that act as recipient of heavy metals pollutants. From the values of EF, these elements can be grouped into two potential sources which are anthropogenic (EF>10) and natural sources (EF<10). The results obtained showed that only 12.5% from all the data from anthropogenic sources and the remaining are came from natural or lithogenic sources. The pattern that was observed in this study is the higher EF value of the elements was recorded as the distance of the sampling point further away from central point. This pattern probably means that the heavy metals distribution throughout the region is generally influenced by the climate conditions - prevailing wind and rainfall. Based on the overall results obtained, it is clearly showed that most of the soils were contaminated by the industrial activities at GIA due to the higher values as compared to the background value.