

DETERMINING LEVEL OF TOXIC HEAVY METALS
(ARSENIC, CADMIUM, LEAD AND MERCURY)
IN HAMPUNG SUNGAI SUDOH'S COHLES (ANADARA GRAYOSA)
BY USING ATOMIC ABSORPTION SPECTROSCOPY

MESMAN BIN SULAIMAN

BACHELOR OF SCIENCE (HONS.) CHEMISTRY
FACULTY OF APPLIED SCIENCES
UNIVERSITI TEKNOLOGI MARA

MAY 2007

**DETERMINING LEVEL OF TOXIC HEAVY METALS
(ARSENIC, CADMIUM, LEAD AND MERCURY)
IN KAMPUNG SUNGAI SULOH'S COCKLES (*Anadara Granosa*)
BY USING ATOMIC ABSORPTION SPECTROSCOPY**

MESMAN BIN SULAIMAN

**Final Year Project Report Submitted in Partial Fulfillment of the Requirements for
the Degree of Bachelor of Science (Hons.) Chemistry in the Faculty of Applied
Sciences, Universiti Teknologi MARA**

MAY 2007

AKNOWLEDGEMENTS

I would like to take this opportunity to acknowledge with gratitude my dearest supervisor, Associate Professor Zuraidah Abdullah Munir. Her guide and word of wisdom has made it possible for me to complete this thesis.

I express my fond thanks to my friends and colleagues, whose words of encouragement kept me going through difficult periods and tight deadlines. I am grateful for their constant support, understanding and patience. Their careful reviews, helpful suggestions and thoughtful criticism have been so important for the improvement and completion of this work.

I would like to thank Encik Adnan Bin Ismail and Encik Mohd Kadim Bin Sarmean for their help in assisting me in doing the laboratory work.

I would also express my thanks to the efforts of previous researchers, book authors, and website authors for their endless efforts in giving their best definition of understanding analytical chemistry. They have certainly eased the completion of this thesis. Their works have been a source of inspiration to us all.

To all that are not mentioned here, I am deeply sorry and would do my very best to thank you.

TABLE OF CONTENTS

AKNOWLEDGEMENT	Page
TABLE OF CONTENTS	i
LIST OF TABLES AND FIGURES	ii-iii
LIST OF SYMBOLS AND ABBREVIATIONS	iv
ABSTRACT	v
ABSTRAK	vi
CHAPTER 1 : INTRODUCTION	1
1.1 Background of Research	1
1.2 Objective	1
1.3 Significance of Study	2
1.4 Background of Site Selection	3
CHAPTER 2 : LITERATURE REVIEW	6
2.1 Heavy Metals	6
2.1.1 Arsenic, <i>As</i>	8
2.1.2 Cadmium, <i>Cd</i>	9
2.1.3 Mercury, <i>Hg</i>	12
2.1.4 Lead, <i>Pb</i>	13
2.2 Bioaccumulation	15
2.3 Cockles, <i>Anadara Granosa</i>	18
2.4 Wet Digestion	21
2.5 Atomic Absorption Spectroscopy, AAS	23
2.6 Previous Study	25
CHAPTER 3 : METHODOLOGY	27
3.1 Collecting Sample	27
3.2 Analyzing Sample	27
3.2.1 Sample Preparation by Wet Digestion	27
3.2.2 Preparation of Standard Solution	29
3.3 Analytical Procedures	29
3.4 Treatment of Data	29

ABSTRACT

DETERMINING LEVEL OF TOXIC HEAVY METALS (ARSENIC, CADMIUM, LEAD AND MERCURY) IN KAMPUNG SUNGAI SULOH'S COCKLES (*Anadara Granosa*) BY USING ATOMIC ABSORPTION SPECTROSCOPY

Concentrations of As, Cd, Hg and Pb in the soft tissues of *Anadara Granosa* were determined by Atomic Absorption Spectroscopy. Sample was collected in February, 2007 from naturally occurring site at Kampung Sungai Suloh, from Batu Pahat district in Johore. These concentration range from 0.551-0.763 mg/kg, 0.711-0.745 mg/kg, 0.356-0.3570 mg/kg and 0.225-0.452 mg/kg for As, Cd, Hg and Pb respectively, in 35 g of dry weight of cockles sample. All the four ranges of metals found in this study were lower than the maximum permissible limits set by Malaysian Food Regulations (1985). Therefore, the consumption of cockles from this site pose no acute toxicological risks of As, Cd, Hg and Pb to humans. Despite the apparent low concentrations of As, Cd, Hg and Pb in the soft tissues of *A. Granosa* on the time the samples were collected, from a public health risk perspective, the data suggested a continued need for monitoring heavy metal pollution in the cockles.