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شبكة المعلومات الجامعية

بسم الله الرحمن الرحيم

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شبكة المعلومات الجامعية

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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B١٢٨١٧

FATE AND BEHAVIOUR OF SOME TRACE METALS IN TWO SITES: GIRONDE ESTUARY (FRANCE) AND ROSETTA ESTUARY (EGYPT)

THESIS
Submitted to the Faculty of Science Alexandria University
for the Degree of Ph. D. in Science
(Geological Oceanography)

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1998

Acknowledgments

The author wishes to express his sincere gratitude to Prof. Dr. ***Mohamed A. EL SABROUTI****, Professor of Geological Oceanography, Faculty of Science, Alexandria University. He was kind enough to follow the progress of the work with keen interest, helpful guidance, useful criticism and continuous encouragement.*

I am also indebted to ***Prof. Dr. Mahmoud Kh. EL SAYED****, Professor of Geological Oceanography, Faculty of Science, Alexandria University, for supervision, helpful guidance, valuable support and constructive advices during the preparation of the manuscript.*

Many thanks are due to ***Prof. Dr. Claude LATOUCHE,*** *Professor of Marine Geochemistry, Faculty of Science, Bordeaux I University, France, because he playes a key role for providing me a study grant through the (Université de Bordeaux I / Ministère Français des Affaires Etrangères) to financially support my field and laboratory studies at the Laboratoire du Département de Géologie et Oceanography, Faculté des Sciences, Université de Bordeaux I, France, during the period from December 1992 to November 1993 and from September 1994 to October 1995. Also, his guidance and advices for field and laboratory search encouraging me during the progress of this work.*

My special thanks are due to ***Miss. N. MAILLET, MRs. LAPAQUELLERIE, LAVAUX, DIGNAN, PARRA, PONS, DUMON, PEDEMAY, JOUANNEAU and ETCHEBER*** *who helped me during the collection of the samples and for their moral support, fruitful help during the laboratory work and their continuos encouragement.*

I have great pleasure in expressing my deep gratitude to ***Dr. Anwar EL FIKY and Mr. Adel MAXIMOS****. Indeed, this manuscript would loose a great part of its skeleton without thier help.*

Finally, I would like sincerely to thank every person of my family without whom nothing of this work would have been accomplished.

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CHAPTER 1

INTRODUCTION

1. 1. General Outline:

No organic life can develop and survive without the participation of metals. Current research has revealed that life is as much inorganic as organic. So, due to the fact that heavy metals entering water ways from either natural or anthropogenic sources become strongly associated with the solid or sediment phase, these materials may accumulate to levels causing a potentially serious threat to the aquatic and benthic organisms. Efforts should be made to elucidate the role of the sediment by examining its adsorbing capacity for metals. Also it is of interest to study some of these metals according to their biological role.

Since the industrial revolution, the efforts of removing man-made pollutants from the natural environment have been unable to keep pace with the increasing amount of waste materials and a growing population that farther exasperates the situation. This has often resulted in the transformation of lakes, rivers and coastal waters into sewage depots where the natural biological balance is severely upset and in some cases totally disrupted (Förstner, 1978)

With the growth of technology, two groups of substances in particular have a lasting effect on the natural balance in aquatic systems:- nutrients, which promote unrestricted biologic growth and, in turn, oxygen depletion, and sparingly degradable synthetic chemicals and other waste substances which often constitute multiple effects on the aquatic ecosystems. Experts estimate that industrial and domestic waste water introduces up to a million pollutants into natural waters. These include substances that are not considered dangerous, although many of them add a disagreable odor or taste to the waters and other significantly upset the ecosystem without being directly

harmful to humans. Other group do, however, have direct and indirect influences on the human organism and can cause serious damage. Substances such as polycyclic aromatics, pesticides, radioactive matter, and trace metals directly endanger human life. This group of pollutants are of note in two respects: firstly, trace metals are not usually eliminated from the aquatic ecosystems by natural processes, in contrast to most organic pollutants, and secondly, most metal pollutants are enriched in minerals and organic substances. Toxic metals such as mercury, cadmium and copper tend to accumulate in bottom sediments from which they may be released by various processes of remobilization, and in changing form can move up the biologic chain, thereby reaching human beings where they produce chronic and acute ailments.

The fact that metals have a biological significance is contradictory to the classical idea that inorganic chemistry is restricted to non-living chemical systems, whereas the living world falls within the realm of organic and biochemistry. Modern research has led to a broader understanding of the inextricability of overlapping ideas in the field of applied chemistry, such as occur in nature, and stresses the need to diverge from artificial compartmentation. It has borne out by experimental evidence that the role of heavy metals in living systems follows the pattern of natural availability and abundance of the same metals occurring in nature (Williams, 1967 ; Vahrenkamp, 1973 and Wood 1974 , 1975).

1.2. Environmental problems with trace elements: