

DETERMINATION OF SOME METALS IN COASTAL SEDIMENTS
OFF PENANG DURING THE PRE AND POST MONSOON
SEASONS


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21/2015

1100034594

LP 27 FST 3 2005



1100034594
Speciation of some metals in coastal sediments off Pahang during the pre and post monsoon seasons / Norhayati Kamaruzaman.



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**SPECIATION OF SOME METALS IN COASTAL SEDIMENTS OFF PAHANG
DURING THE PRE AND POST MONSOON SEASONS**

By

Norhayati binti Kamaruzaman

**Research Report is submitted in partial fulfillment of
the requirements for the degree of
Bachelor of Science (Marine Sciences)**

**Department of Marine Sciences
Faculty of Science and Technology**

This project report should be cited as :

Norhayati, K. 2005. Speciation of some metals in coastal sediments off Pahang during the pre and post monsoon seasons. Undergraduate thesis, Bachelor of Science in Marine, Faculty of Applied Science and Technology, Kolej Universiti Sains dan Teknologi Malaysia, Terengganu. 83 p.

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Istimewa buat....

*Keluarga tersayang....
(Abah, mak, kak ummi, alang, adik)
dan
rakan seperjuangan sekalian....*



**DEPARTMENT OF MARINE SCIENCE
FACULTY OF SCIENCE AND TECHNOLOGY
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ACKNOWLEDGMENTS

Alhamdulillah, thanks to the God for his blessing because this project finally completed after I faced too many difficulties. Firstly, I would like to thanks my parents, sister and brother for their love which make me become stronger throughout my study at KUSTEM. Nothing can give for all what you had done.

Thanks also, to my supervisor Prof. Dr. Hj. Noor Azhar Mohamed Shazili for his guidance, advice, patience and guidance in this research. Not to forget to Dr. Antonina Abdullah for her help along this final project.

To all oceanography lab assistants like En. Raja, En. Sulaiman, En Kamari and En. Kamarun thanks for their cooperation. Special appreciation is dedicated to Master Science student, Benny who always assisted me throughout this project. Lastly, my best group Eja, Dilla, Kakju, Azie, Ina, Is, Aini and Mira. May God bless all of you. Also to my batch Marine Science students 2004/05, nice to know you all.

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LIST OF SYMBOLS

SYMBOL

Pb	Lead
Zn	Zinc
Cu	Copper
Mn	Manganese
Fe	Iron
Al	Aluminium
g	gram
$\mu\text{g g}^{-1}$	microgram per gram
AAS	Atomic Absorption Spectrophotometer
ppm	Part per million
mg/L	Milligram per liter
$\mu\text{g/g}$	Microgram per gram
F1	Exchangeable
F2	Bound to Carbonates
F3	Bound to Fe-Mn hydroxides
F4	Bound to Organic Matter
F5	Residual
NBS	National Bureau of Standards
%	Percentage

°C	Degree Celsius
v/v	Volume/Volume
HF	Hydrofluoric acid
HOAc	Acetate acid
HCl	Hydrochloric acid
H ₂ O ₂	Hydrogen peroxide
HNO ₃	Nitric acid
MgCl ₂	Magnesium chloride
NaOAc	Sodium acetate
NH ₂ OH HCl	Hidrosilamin hydrochloride
NH ₄ OAc	Ammonium acetate
TOC	Total Organic Carbon

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**KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA
2004/05**

ABSTRAK

Kaedah penganalisan secara berturutan dipercayai dapat menentukan tahap pencemaran di sesuatu kawasan dengan lebih baik berbanding ujian penormalan dan faktor pengkayaan. Penyempelan sedimen permukaan di perairan Pahang dilakukan pada musim pra-monsoon dan pasca-monsoon. Sebanyak lima stesen dengan kandungan tanah liat yang tinggi diambil untuk penganalisan logam secara berturutan. Logam berat yang dikaji ialah Kuprum (Cu), Plumbum (Pb), Zink (Zn), Mangan (Mn), Ferum (Fe) dan Aluminium (Al). Keputusan daripada analisis ini mendapati bahawa semua logam berat yang dikaji didapati terkandung dalam fasa hasil logam iaitu dalam bentuk non-anthropogenik kecuali Cu semasa musim pasca-monsoon. Terdapat lima fasa yang membezakan bentuk kandungan logam berat dalam enapan iaitu fasa pertukaran kation, fasa karbonat, fasa terturun mudah, fasa organik dan fasa hasil logam. Kepekatan jumlah logam berat dalam fasa didapati tinggi pada pasca-monsoon kecuali untuk logam Mn dan Fe. Ini menunjukkan taburan logam berat dipengaruhi oleh angin monsoon.

ABSTRACT

Sequential extraction was found to be the best method to study the pollution level in sediment compared to normalization and enrichment factor tests. Sediment samples were collected off the Pahang coastline during pre monsoon and post monsoon period. Five stations with relatively high clay contents were sampled for sequential extraction studies of Copper (Cu), Lead (Pb), Zinc (Zn), Manganese (Mn), Iron (Fe) and Aluminium (Al). The results during both monsoon seasons show a non-anthropogenic of analyze metals except Cu during post monsoon period. The major accumulation fractions observed for the heavy metal studied were residual fraction, bound to Fe-Mn hydroxides and bound to organic matter fraction. In general, the concentrations of metals were higher in the post monsoon season except for Mn and Fe. This related to the influence of the monsoon season on sediment.