

A STUDY ON MINERAL CONTENTS,
SEDIMENTOLOGICAL CHARACTERISTICS,
AND CHEMICAL CONTENTS OF KERTEH
ESTUARINE RIVER AND LAGOON
SEDIMENTS

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FACULTY OF MARITIME STUDIES AND
MARINE SCIENCE
UNIVERSITI MALAYSIA TERENGGANU

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**A STUDY ON MINERAL CONTENTS, SEDIMENTOLOGICAL CHARACTERISTICS,
AND CHEMICAL CONTENTS OF KERTEH ESTUARINE RIVER AND LAGOON
SEDIMENTS**

By

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

**Department of Marine Science
Faculty of Maritime Studies and Marine Science
UNIVERSITI MALAYSIA TERENGGANU**

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DECLARATION AND VERIFICATION REPORT

FINAL YEAR RESEARCH REPORT

It is hereby declared and verified that this research report entitled ; A Study On Mineral Contents, Sedimentological Characteristics, And Chemical Contents Of Kerteh Estuarine River And Lagoon Sediments by Siti Hajar binti Azlan, Matric No. UK16004 have been examined and all errors identified have been corrected. This report is submitted to the Department of Marine Science as partial fulfillment towards obtaining the Degree of Bachelor of Science (Marine Science), Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

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LIST OF ABBREVIATIONS / SYMBOLS

%	Percentage
°C	Degree celcius
∞	Infinity
mL	Milliliter
μm	Micrometer
φ	Phi
cm	centimeter
mm	Millimeter
g	Gram
Q	Quartz
O	Oxygen
Si	Silicon
Al	Aluminium
Ca	Calcium
K	Potassium
Mg	Magnesium
Cu	Copper
Mn	Manganese
Fe	Iron
Na	Sodium

Cl	Chlorine
C	Carbon
Ti	Titanium
S	Sulphur
Pb	Lead
Ce	Cerium
SiO ₂	Silicon Oxide
Al ₂ O ₃	Aluminium Oxide
FeO	Iron Oxide
CaO	Calcium Oxide
MgO	Magnesium Oxide
K ₂ O	Potassium Oxide
HCL	Hydrochloric acid
H ₂ O ₂	Hydrogen Oxide
MgCl ₂	Magnesium Chloride
PSA	Particle Size Analyzer
GPS	Global Positioning System
SEM-EDS	Scanning Electron Microscope-Energy Dispersive X-ray Spectroscopy
USDA	United States Department of Agriculture
>	More than
<	Less than

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ABSTRACT

A study on the mineral contents, sedimentological characteristics and chemical contents in the sediments of Kerteh Estuarine river and lagoon conducted. The sediments were collected using Ekman Grab from 8 stations and put in a labeled plastic bags and brought back to the laboratory for analysis. The minerals were determine using Quantitative Mineral Estimation Method and Scanning Electron Microscope., sedimentological characteristics were analyzed using Particle Size Analyzer(PSA) and the chemical contents were determine using X-ray Fluorescence machine. Results show that the minerals present was quartz, ilmenite, magnetite, spinel, hematite, zircon, rutile, tourmaline, pyrite, hydroilmenite, olivine, blue-anatase, leucoxene and topaz. Results on sedimentological characteristics show that the mean size value has an average of 6.62375ϕ , sorting 1.89125ϕ , skewness 0.03125ϕ , and kurtosis 2.59ϕ . For the chemical contents show that the elements present is O(42%), Si (26%), Mg (3%), Al (9%), K (3%), Ti (0%- trace), V (Vanadium), Fe (9%), Ba (1%), Pb (4%), Cl (2%), Ca (2%), Cu (1%), Ce (0%- trace), Cr (0%- trace), La (0%- trace), Pr (0%- trace), and Th (0%- trace). The high percentage of Si and O might be due to the existence of mineral quartz and oxides. In term of sedimentological characteristics the lowest mean of particle size is located in station 5 which is located at the area where the ocean meets the river and the highest mean was at the middle of lagoon area. The highest sorting value is located at station 8 which is located at the innermost part of lagoon area and the lowest is at station 4 which is located at the river area. In term of the texture class for the study area was silty clay loam. The study area has at least 30% of clay.

ABSTRAK

Kajian tentang kandungan mineral, ciri-ciri sedimentologi, dan kandungan kimia dalam sedimen dari sungai dan lagun Kerteh telah dijalankan di Sungai Kerteh. Sedimen telah diambil menggunakan Ekman Grab dari lapan stesen dan disimpan dalam beg plastik yang berlabel. Sampel seterusnya dibawa pulang ke makmal untuk dianalisis. Pengecaman mineral telah dijalankan menggunakan Teknik Penganggaran Mineral Kuantitatif dan mesin Scanning Electron Microscope-Energy Dispersive Spectroscopy, ciri-ciri sedimentologi dianalisis menggunakan Particle Size Analyzer (PSA), manakala kandungan kimia dianalisis menggunakan mesin X-ray Fluorescence. Keputusan analisis menunjukkan bahawa jenis-jenis mineral yang wujud adalah kuarza, ilmenit, magnetit, spinel, hematit, zirkon, rutil, turmalin, pirit, hidroilmenit, olivine, anatase biru, leucosene dan topaz. Keputusan untuk ciri-ciri sedimentologi menunjukkan nilai saiz min secara puratanya adalah 6.62375ϕ , susunan 1.89125ϕ , kepencongan 0.03125ϕ , dan kurtosis 2.59ϕ . Bagi kandungan kimia menunjukkan elemen yang wujud adalah O(42%), Si (26%), Mg (3%), Al (9%), K (3%), Ti (0%- trace), V (Vanadium), Fe (9%), Ba (1%), Pb (4%), Cl (2%), Ca (2%), Cu (1%), Ce (0%- trace), Cr (0%- trace), La (0%- trace), Pr (0%- trace), dan Th (0%- trace). Peratus yang tinggi bagi Si dan O kemungkinan disebabkan oleh kehadiran mineral kuarza dan oksida. Dari segi ciri-ciri sedimentologi nilai min yang rendah ditunjukkan di stesen 5 yang berada di kawasan pertembungan antara laut dan sungai manakala min yang tertinggi ditunjukkan oleh kawasan yang paling jauh ke dalam lagun. Secara keseluruhannya kawasan ini mempunyai sekurang-kurangnya 30% tanah liat dalam sedimen.