MINERALOGY OF MUD COASTAL
SOUTH CHINA SEA SEDIMENTS

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Mineralogy of Johor coastal (South China Sea) sediments / Soh Ai Ni.

Lihat sebelah

MINERALOGY OF JOHOR COASTAL (SOUTH CHINA SEA) SEDIMENTS

BY
SOH AI NI

Research report submitted in partial fulfillment of the requirements for the degree of Bachelor of Science (Marine Science)

DEPARTMENT OF MARINE SCIENCE
FACULTY OF SCIENCE AND TECHNOLOGY
UNIVERSITY COLLEGE OF SCIENCE AND TECHNOLOGY MALAYSIA
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DEDICATED TO:

MY DEAREST FATHER, MOTHER AND FAMILY
THANKS FOR YOUR ENCOUGEMENT AND SUPPORT

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PENGAKUAN DAN PENGESAHAN LAPORAN PROJEK PENYELIDIKAN I DAN II

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: Mineralogi Tentang Sedimen di Persisiran Pantai Johor (Laut China Selatan) oleh Soh Ai Ni, No. Matrik: UK 7787 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Samudera sebagai memenuhi sebahagian daripada keperluan memperolehi Ijazah Sarjana Muda Sains – Sains Samudera, Fakulti Sains dan Teknologi, Kolej Universiti Sains dan Teknologi Malaysia.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS / SYMBOLS

%	percentage
^0C	degree Celcius
L	liter
mL	milliliter
μm	micrometer
cm	centimeter
mm	millimeter
g	gram
M	mol
$NaHCO_3$	Sodium Bicarbonate
H_2O_2	Hydrogen Peroxide
HCL	Hydrochloric Acid
$MgCl_2$	Magnesium chloride
>	More than
<	Less than
Q	Quartz
Gi	Gibbsite
Go	Goethite
Na	Sodium
Na_2O	Sodium oxide
K	Potassium

K_2O	Potassium oxide
Mg	Magnesium
MgO	Magnesium oxide
Al	Aluminium
Al_2O_3	Aluminium oxide (Corundum)
SiO_2	Silicon oxide (Quartz)
Ca	Calcium
CaO	Calcium oxide
Fe	Iron
Fe_2O_3	Iron oxide (Hematite)
V	Vanadium
V_2O_5	Vanadium oxide
Ti	Titanium
TiO_2	Titanium oxide
C	Calcite
$CaCO_3$	Calcite / Calcium carbonate
Cl	Chlorine
Fe OOH	Goethite
O	Opaque materials
SEM	Scanning Electron Microscope
EDS	Energy Dispersive X-ray Spectroscopy
CPS	Count per second

LIST OF APPENDICES

ABSTRAK

Kajian dijalankan untuk mengenalpasti jenis sedimen dan kandungan mineral dalam sedimen di sekitar persisiran pantai Johor. Sedimen diambil daripada tiga puluh stesen di persisiran pantai Johor dengan menggunakan Smith McIntyre Grab yang beroperasi dari kapal KL CERMIN dari Jabatan Perikanan. Sedimen yang terkumpul dimasukkan ke dalan plastik beg yang berlabel dan dibawa balik ke makmal untuk analisis. Sampel sedimen itu diudarakeringkan untuk langkah penyediaan yang seterusnya. Untuk tujuan kajian, sedimen yang berpasir tidak dipilih untuk menjalankan analisis. Jadi, hanya dua puluh sampel sedimen sahaja yang diambil. Kandungan mineral di dalam pasir dan kelodak dari sedimen ditentukan dengan menggunakan mikroskop petrografik. Manakala mineral liat dalam sedimen dikesan dengan menggunakan Scanning Electron Microscope (SEM). Keputusan menunjukkan bahawa quartz merupakan mineral yang paling dominan dalam bahagian pasir sedimen. Goethite and gibbsite juga didapati di dalam sedimen sesetengah stesen. Manakala quartz and calcite merupakan mineral yang dikesani paling banyak di dalam bahagian kelodak sedimen kawasan kajian. Untuk mineral liat pula, ia didominasi oleh mineral-mineral seperti kaolinite [$Al_2Si_2O_5(OH)_4$], illite [$K_yAl_4(Si_{8-y},Al_y)O_{20}(OH)_4$] dan quartz [$SiO_2$]. Montmorillonite dan feldspars hanya didapati sedikit sahaja di dalam bahagian liat tetapi distribusi kedua-dua mineral itu adalah agak konsisten. Manakala, kandungan CaO dalam bahagian liat adalah agak ketara. Daripada analisis hydrometer, didapati bahawa tekstur kebanyakan sedimen di kawasan kajian ialah sandy clay loam. Tekstur lain adalah sandy loam, loam dan clay loam. Ini menunjukkan bahawa sedimen di kawasan kajian adalah agak berpasir. Jenis sedimen yang didapati di kawasan kajian adalah sedimen terrigenous (lithogenous) dan biogenous.

ABSTRACT

The study was conducted to determine the sediment types and mineral contents in Johor coastal sediments. The sediment samples were collected from thirty stations at the Johor coastal area (South China Sea) using the Smith McIntyre Grab operated from the Fisheries Department vessel KL CERMIN. Sediments collected were put in labeled plastic bags and then were brought back to the laboratory for analysis. These sediments were air-dried for sample preparation. For the purpose of this study, the sediment samples which are sandy are not considered in the analysis. Only twenty sediment samples out of the thirty stations were taken. Mineral contents in the sand and silt fractions were determined using petrographic microscope. While the clay minerals in sediment were detected using the Scanning Electron Microscope (SEM). Results of the sand fractions showed that quartz is the dominant mineral found in the study area. Goethite and gibbsite are also found in some stations while quartz and calcite are the dominant minerals found in the silt fraction. For clay minerals, kaolinite [$Al_2Si_2O_5$ $(OH)_4$], illite [$K_yAl_4(Si_{8-y},Al_y)O_{20}(OH)_4$] and quartz [$SiO_2$] are found dominant in all stations of the study area. Montmorillonite and feldspars are found few in these clays and the distribution of these two minerals is quite constant. On the other hand, the contents of CaO in the clays are quite variable. From the hydrometer analysis, most of the texture in the sediments is sandy clay loam. Other textures are sandy loam, loam and clay loam. This also indicated that the sediments in the Johor coasts are quite sandy. The main sediment types in the study area are terrigenous (lithogenous) and biogenous sediments.