STUDY ON MINERALOGY AND GEOCHEMISTRY OF SEDIMENTS AT PULAU BIDONG, TERENGGANU

MOHD ADI MATIN BIN AHMAD

FACULTY OF MARITIME STUDIES AND MARINE SCIENCE
UNIVERSITI MALAYSIA TERENGGANU

2012

Study on mineralogy and geochemistry of sediments at Pulau Bidong, Terengganu / Mohd Adi Matin Ahmad.

STUDY ON MINERALOGY AND GEOCHEMISTRY OF SEDIMENTS AT PULAU BIDONG, TERENGGANU

By

Mohd Adi Matin Bin Ahmad

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

2012

This project report should be cited as:

Ahmad, M. A. M. 2012. Study on Mineralogy and Geochemistry of Sediment at Pulau Bidong, Terengganu. Undergraduate thesis, Bachelor of Science in Marine Science, Faculty of Maritime Studies and Marine Science, University Malaysia Terengganu, Terengganu, 55p.

DEPARTMENT OF MARINE SCIENCE
FACULTY OF MARITIME STUDIES AND MARINE SCIENCE
UNIVERSITI MALAYSIA TERENGGANU

DECLARATION AND VERIFICATION FORM

FINAL YEAR RESEARCH PROJECT

It is hereby declared and verified that this research report entitled:

Study on Mineralogy and Geochemistry of Sediments at Pulau Bidong, Terengganu by **Mohd Adi Matin Bin Ahmad**, Matric No. **UK21281** has been examined and all errors identified have been corrected. This report issubmitted 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.

Verified by:

.....

Principal Supervisor

Name: Dr. Antonina Abdullah

Official stamp: DR. ANTONINA ABDULLAH
Lecturer
Department of Marine Science
Faculty of Maritime Studies and Marine Science
Universiti Malaysia Terengganu (UMT)
21030 Kuala Terengganu

Date: 17 June 2012

.....

Second Supervisor (where applicable)

Name:

Official stamp:

Date:

.....

.....

Head of Department of Marine Science

Name: Prof. Madya Dr. Rosnan Yaacob

Official stamp: PROF. MADYA DR. ROSNAN BIN YAACOB
Ketua
Jabatan Sains Marin
Fakulti Pengajian Maritim dan Sains Marin
Universiti Malaysia Terengganu
21030 Kuala Terengganu

Date: 17-6-2012

ACKNOWLEDGEMENT

First of all, thank to Allah the Almighty who provides His bountiful blessings for all the works done.

I would like to extend my sincerely gratitude to my dedicated supervisor, Dr. Nor Antonina Abdullah for her assistance and strongly encouragement in pursuing my Final Year Project. Without her guidance and financial support, this project would not successfully be able to materialize.

I also take this opportunities to express my deep appreciation to Marine Science Department staffs, Mr. Sainol Aimi, Mr. Muhamad Naim and Mr. Suliman Kasim, SEM Laboratory staffs, Mr. Muhamad Nasir and Mrs.Norita Abd Shukor, Physic Department staff, Mrs. Nusaibah Yusof, Mr. Razman Ngah and Mr. Zulbairuddin Alias for allowing me to use laboratory apparatus and materials needed for my experiment.

I also wish to express my gratitude to my fellow freinds, Ms. Ranjini, Mr. Nur Firdaus, Mr. Goh Wei Sin and Mr. Hafiz Ridhuan for their help, kindness and valueble ideas in order for me to finish up the project.

Last but not least, I would like to thank to my beloved parent, Mr. Ahmad Bakar and Mrs. Zainab Abd Rahman and all my family members for their support, cooperation and great understanding.

TABLE OF CONTENTS

LIST OF TABLE

LIST OF FIGURES

LIST OF ABBREVIATION

$CaCO_3$	Calcium carbonate / Calcite
SiO_2	Silicon dioxide / Quartz
$Al(OH)_3$	Gibbsite
Fe_2O_3	Hematite
$AlSi_2O_5$	Kaolinite
$FeTiO_3$	Ilmenite
TiO_2	Rutile
$NaAlSi_3O_8$	Feldspar
>	More than
<	Less than
%	Per cent
mL	Mililiter
μm	Micrometer
mm	Milimeter
g	Gram
M	Molar
N	Normality
HCl	Hydrochloric acid
H_2O_2	Hydrogen peroxide
$MgCl_2$	Magnesium Chloride
^0C	Degree Celsius

LIST OF APPENDICES

ABSTRACT

This study was done in order to determine the minerals contain in sediments of Pulau Bidong, Terengganu. The study also analysed the geochemistry aspect of the sediments. The sediments were collected at 32 sampling stations around Pulau Bidong water. Sediment can be defined as a fine or coarse particles that have settled to accumulate on the seafloor. Sediment consists of detritus like mineral grains and rock fragments derived from pre-existing rock. X-ray Diffractometer (XRD) was used and a total of 8 identifiable minerals were recorded in the sediments samples. Quartz (SiO_2) was the most abundance mineral identified. Quartz is a common and abundant mineral occurring in a great variety of geological environments. Quartz occurs in hydrothermal veins and pegmatite. Well-formed crystals may reach several meters in length and weigh hundreds of kilograms. These veins may bear precious metals such as gold or silver, and form the quartz ores sought in mining. Erosion of pegmatites may reveal expansive pockets of crystals, known as "cathedrals." Quartz is a common constituent of granite, sandstone, limestone, and many other igneous, sedimentary, and metamorphic rocks. In addition, from Scanning Electron Microscope Energy Dispersive Spectroscopy (SEM-EDS) analysis, it showed that the quartz also the abundance oxide compound followed with other compounds. From sedimentological characteristics analysis, the sediments of the island classified as medium sand for the mean value, poorly sorted for sorting, positive skewnees value and very leptokurtic for the kurtosis value.

KAJIAN MENGENAI MINERALOGI DAN GEOKIMIA PADA SEDIMEN PULAU BIDONG, TERENGGANU

ABSTRAK

Kajian ini dilakukan untuk menentukan kandungan mineral yang terdapat pada sedimen di Pulau Bidong, Terengganu. Selain itu, kajian ini juga menganalisis sedimen dari aspek geokimia. Sedimen telah diambil dari 32 stesen persempelan di sekitar perairan Pulau Bidong. Sedimen boleh ditakrifkan sebagai partikel halus atau kasar yang telah mendap dan terkumpul di dasar laut. Sedimen detritus yang terdiri dari butiran mineral dan serpihan batu yang berasal dari batu sedia ada. Alat yang dikenali sebagai X-ray Diffractometer (XRD) telah digunakan dan sebanyak 8 jenis mineral dikenal pasti dan direkodkan. Kuarza (SiO_2) adalah mineral yang paling banyak ditemui. Kuarza merupakan bahan mineral yang biasa dan banyak terdapat dalam pelbagai persekitaran geologi. Kuarza merupakan hasil dari hidroterma dan pegmatite. Kristal yang terbentuk dengan baik boleh mencapai beberapa meter panjang dan berat beratus kilogram. Ia boleh mengandungi logam berharga seperti emas atau perak serta membentuk bijih yang boleh dilombong. Di samping itu, analisis dari Scanning Electron Microscope Energy Dispersive Spectroscopy (SEM-EDS) juga menunjukkan bahawa sebatian oksida yang banyak merupakan kuarza diikuti dengan sebatian lain. Hasil dari analisis ciri-ciri sedimentology menunjukan sedimen dikelaskan sebagai pasir sederhana kasar bagi nilai min, sisihan tidak sempurna bagi penyisihan, kepencongan positif dan sangat leptokurtik bagi kurtosis.