

MAJOR ELEMENTS AND OXIDES IN  
SEDIMENTS OF JOHOR COASTS  
(SOUTH CHINA SEA)

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MAJOR ELEMENTS AND OXIDES IN SEDIMENTS OF JOHOR COASTS  
(SOUTH CHINA SEA)

By

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

Department of Marine Science  
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2006

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***DEDICATED TO:***

***MY DEAREST FATHER, MOTHER AND FAMILY.***

***THANKS FOR YOUR ENCOURAGEMENT AND SUPPORT.***

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Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk:

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## LIST OF ABBREVIATIONS / SYMBOLS

%	percentage
<sup>0</sup> C	degree Celcius
Φ	phi
L	liter
mL	mililiter
μm	micrometer
cm	centimeter
mm	milimeter
g	gram
N	Normality
M	mol
Q	quartz
O	opaque material
Si	silicon
Al	aluminium
O	oxygen
Ca	calcium
K	potassium
Mg	magnesium
Fe	iron
Na	sodium
Cl	chlorine



Mn	manganese
SiO <sub>2</sub>	Silicon oxide
Al <sub>2</sub> O <sub>3</sub>	Aluminium oxide
FeO	Iron oxide
CaO	Calcium oxide
Na <sub>2</sub> O	Sodium oxide
MgO	Magnesium oxide
K <sub>2</sub> O	Potassium oxide
NaHCO <sub>3</sub>	Sodium Bicarbonate
HCl	Hydrochloric Acid
H <sub>2</sub> O <sub>2</sub>	Hydrogen Peroxide
MgCl <sub>2</sub>	Magnesium Chlorite
AV	average
SD	standard deviation
>	more than
<	less than
SEM-EDS	Scanning Electron Microscope & Energy Dispersive Spectroscopy

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## ABSTRACT

Twenty sediments samples were collected from the Johor coastal areas (South China Sea). The sediments were analyzed to determine the major elements, oxides and sediment texture in the study area. The major elements and oxides were analyzed using the Scanning Electron Microscope and Energy Dispersive Spectroscopy (SEM-EDS) while the texture was determined using the hydrometer method. In general, the dominant elements found in the sediments of the study area are Si, Al and Fe and the oxide is  $\text{SiO}_2$  which indicates that the area is highly siliceous ( $\text{SiO}_2$ ). The dominance of quartz might be due to the weathering products of granite, which is the dominant rock found along the coastal area of East Coast of Peninsular Malaysia.  $\text{Al}_2\text{O}_3$  and FeO are the next most abundant major oxide components after  $\text{SiO}_2$  which indicates that feldspar and iron minerals are the common minerals found in sediments of the study area. MgO and  $\text{K}_2\text{O}$  are the minor oxides in sediments. In addition, the  $\text{SiO}_2 / \text{Al}_2\text{O}_3$  ratio indicates that quartz and feldspar are present in roughly equal abundances in the sediments while the range of  $\text{SiO}_2 / \text{CaO}$  ratios indicates that quartz has a much greater abundance than calcium carbonate in sediments of study area. For the texture analysis, sandy clay loam covers almost 70% in the study area. It clearly showed that the study area was mainly covered by sandy sediment. Clay texture was only found in station 30 which is located offshore.

## ABSTRAK

Sebanyak dua puluh sampel telah diambil semasa penyempalan, dimana ia telah dijalankan di persisiran pantai Johor (Laut China Selatan). Sampel sedimen telah dilakukan analisis untuk mengkaji komposisi elemen dan oksida serta juga tekstur sedimen untuk sedimen persisiran pantai Johor (Laut China Selatan). Alat Scanning Electron Microscope dan Energy Dispersive Spectroscopy (SEM-EDS) telah digunakan untuk menganalisis komposisi dan oksida sedimen manakala bagi tekstur sedimen, kaedah hydrometer telah digunakan. Secara umumnya, Si, Al dan Fe adalah dominan dalam sedimen kawasan kajian dan silika oksida ( $\text{SiO}_2$ ) yang tinggi menunjukkan kawasan kajian adalah sangat siliceous. Kuarza adalah dominan di kawasan kajian. Kawasan kajian ini didominasi oleh kuarza adalah disebabkan hasil produk daripada granite akibat proses luluhawa, dimana batu granite adalah dijumpai mendominasi di sepanjang persisiran pantai timur Semenanjung Malaysia.  $\text{Al}_2\text{O}_3$  dan FeO adalah dominan oksida selepas  $\text{SiO}_2$  yang menunjukkan feldspar dan Fe mineral adalah mineral yang biasa didapati dalam sedimen di kawasan kajian. MgO dan  $\text{K}_2\text{O}$  wujud sebagai minor oksida dalam sedimen. Tambahan pula, nisbah bagi  $\text{SiO}_2 / \text{Al}_2\text{O}_3$  menunjukkan kuarza dan feldspar wujud dalam peratus yang agak sama dalam sedimen di kawasan kajian manakala nisbah bagi  $\text{SiO}_2 / \text{CaO}$  pula menunjukkan lebih banyak kuarza daripada kalsium karbonat dalam sedimen di kawasan kajian. Bagi analisis tekstur pula, sandy clay loam adalah dominan tekstur kelas yang merangkumi 70% kawasan kajian.. Ini dengan jelas menunjukkan kawasan kajian adalah didominasi oleh sedimen pasir. Namun begitu, tekstur berliat hanya dijumpai di stesen 30 di kawasan luar pantai.