


STUDY ON THE DISTRIBUTION OF HYDROCARBONS IN THE WATERS
AND SEDIMENT AROUND MERAS ISLAND, MARANG, TERENGGANU

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**STUDY ON THE DISTRIBUTION OF HYDROCARBONS IN THE WATERS
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By

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**JABATAN SAINS SAMUDERA
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Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk:

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LIST OF ABBREVIATIONS

g	- Gram
m	- Meter
km	- Kilometer
km ²	Kilometer Square
mL	- Milliliter
mg	- Milligram
mg.kg ⁻¹	- Milligram per kilogram
mg.L ⁻¹	- Milligram per liter
M	- Molar
ppb	- Part per billion
ppm	- Part per million
ppt	- Part per thousand
μg	- Microgram
μg.g ⁻¹	- Microgram per gram
μg.mL ⁻¹	- Microgram per milliliter
μg.L ⁻¹	- Microgram per liter
μL	- Microliter
s	- Second
min	- Minute
%	- Percentage
C	- Carbon
°C	- Celsius Degree
HCl	- Acid hydrochloric
GC	- Chromatography Gas
CH ₂ Cl ₂ / DCM	- Dichloromethane
Na ₂ SO ₄	- Sodium sulfate
PAH	- Polycyclic Aromatic Hydrocarbon
PSA	- Particle Size Analysis
TAH	- Total Aliphatic Hydrocarbon
TEL	- Total Extractable Lipid
TH	- Total Hydrocarbon
TOC	- Total Organic Carbon

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ABSTRACT

The distribution of hydrocarbons in water and sediment samples around Pulau Kapas were determined quantitatively and qualitatively by using Gas Chromatography with Flame Ionization Detector (GC - FID). Ten sampling sites were being established. The mean of TAH and PAH in seawaters for first sampling ranged from 0.004 $\mu\text{g.mL}^{-1}$ to 14.173 $\mu\text{g.mL}^{-1}$ and from 0.005 $\mu\text{g.mL}^{-1}$ to 5.207 $\mu\text{g.mL}^{-1}$. The mean of TAH and PAH in seawaters for second sampling ranged from 0.519 $\mu\text{g.mL}^{-1}$ to 18.382 $\mu\text{g.mL}^{-1}$ and from 0.363 $\mu\text{g.mL}^{-1}$ to 16.853 $\mu\text{g.mL}^{-1}$. The dominant species of TAH found in seawaters at most station was C18 while the dominant species of PAH was Phenanthrene. The mean of TAH and PAH in sediments for first sampling ranged from 1.571 $\mu\text{g.g}^{-1}$ to 284.939 $\mu\text{g.g}^{-1}$ and from 0.279 $\mu\text{g.g}^{-1}$ to 73.306 $\mu\text{g.g}^{-1}$. The mean of TAH and PAH in sediments for second sampling ranged from 0.428 $\mu\text{g.g}^{-1}$ to 115.270 $\mu\text{g.g}^{-1}$ and from 0.145 $\mu\text{g.g}^{-1}$ to 41.450 $\mu\text{g.g}^{-1}$. The dominant species of TAH found in sediments at most station was C18 while the dominant species of PAH was Phenanthrene. The results indicate that the area around Pulau Kapas was still unpolluted with hydrocarbon. Anyway there were some exceptions where station 3, 4, 5 and 10 with a higher TAH concentration in the sediments during the first sampling and Station 7 in the second sampling.

ABSTRAK

Kajian tentang taburan hidrokarbon di dalam air dan sediment di sekitar Pulau Kapas ditentukan secara kuantitatif dan kualitatif dengan menggunakan GC – FID. 10 stesen kajian telah dipilih. Min kandungan hidrokarbon TAH dan PAH di dalam air laut untuk penyampelan pertama adalah berjulat di antara $0.004 \mu\text{g.mL}^{-1}$ - $14.173 \mu\text{g.mL}^{-1}$ dan berjulat di antara $0.005 \mu\text{g.mL}^{-1}$ - $5.207 \mu\text{g.mL}^{-1}$ masing-masing. Manakala bagi min kandungan hidrokarbon TAH dan PAH di dalam air laut untuk penyampelan kedua adalah berjulat di antara $0.519 \mu\text{g.mL}^{-1}$ - $18.382 \mu\text{g.mL}^{-1}$ dan berjulat di antara $0.363 \mu\text{g.mL}^{-1}$ - $16.853 \mu\text{g.mL}^{-1}$ secara berasingan. Spesis dominan bagi TAH ialah C18 manakala spesis dominan bagi PAH ialah Phenanthrene di dalam air laut. Untuk min kandungan hidrokarbon TAH berjulat di antara $1.571 \mu\text{g.g}^{-1}$ - $284.939 \mu\text{g.g}^{-1}$ dan PAH berjulat di antara $0.279 \mu\text{g.g}^{-1}$ - $73.306 \mu\text{g.g}^{-1}$ di dalam sedimen untuk penyampelan pertama. Manakala bagi min kandungan hidrokarbon TAH berjulat di antara $0.428 \mu\text{g.g}^{-1}$ - $115.270 \mu\text{g.g}^{-1}$ dan PAH berjulat di antara $0.145 \mu\text{g.g}^{-1}$ - $41.450 \mu\text{g.g}^{-1}$ di dalam sedimen untuk penyampelan kedua. Spesis dominan bagi TAH ialah C18 manakala spesis dominan bagi PAH ialah Phenanthrene di dalam sedimen. Keputusan di atas menunjukkan bahawa tiada pencemaran hidrokarbon di perairan Pulau Kapas. Tetapi terdapat kandungan TAH yang agak tingginya dalam sedimen di stesen 3, 4, 5 and 10 untuk penyampelan pertama serta stesen 7 untuk penyampelan kedua.