

DISTRIBUTION OF ALIPHATIC AND AROMATIC HYDROCARBONS
IN SURFACE SEDIMENT OF KINTOM RIVER, TERENGGANU.

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2005

**DISTRIBUTION OF ALIPHATIC AND AROMATIC HYDRCARBONS IN
SURFACE SEDIMENT OF KERTIH RIVER, TERENGGANU.**

By

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**Research Report submitted in partial fulfillment of
the requirements for the degree of
Bachelor of Science (Analytical and Environmental Chemistry)**

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KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA
2005**

1100038683



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Distribution of Aliphatic and Aromatic Hydrocarbons in Surface Sediment of Kertih River, Terengganu oleh Neo Poh Poh, No. Matrik UK 7657 telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Kimia sebagai memenuhi sebahagian daripada keperluan memperoleh Ijazah Sarjana Muda Sains (Kimia Analisis Dan Persekitaran), Fakulti Sains dan Teknologi, Kolej Universiti Sains dan Teknologi Malaysia.

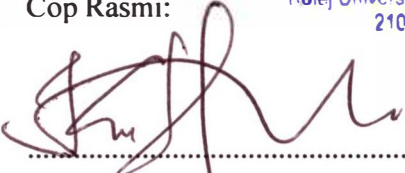
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ACKNOWLEDGEMENT

I am so grateful of being able to finish my final year report successfully even though have to overcome so much difficulty. First and foremost, I would like to thank my supervisor, Dr. Mohamed Kamil Bin Abdul Rashid for giving and sharing his ideas and suggestions to guide me in this project. I am very appreciative for all the supports that he given to me.

I would also like to express my deeply thanks to my co-supervisers, Dr Habsah binti Mohomad and Dr Ismat Ali for giving me support and ideas while doing the project.

Special thanks to my seniors, Abang azim, Kak Hasra, Mr Vikrant, Mr Ong, Mr Hock Seng, Miss Benny, Mr Kam Yew, Mr Zhao Choon, Mr Wei Kean, Abang Roslan, cause giving me a lot of helps, advice and opinions while facing the problems.

Besides that, I would like to express my appreciation to the lab assistants of Chemistry Department, Encik Azrul, Abang Ruzeman, En. Maswadi, Kak Nore, En. Jamal, Tarmiz, En. Muzaffeq and Puan Asbah for all their kind help and assistance. This project not going to be success without their helps.

Special acknowledgement towards my course mates and house mates, Fong Chee, Siaw Hun, Ah Yen, Islah, Emmy, Anum, Alex, Yik Seng, Hong Lim, Shirley and also my parents who give me mentally and financial supports.

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LIST OF ABBREVIATIONS

Symbol / Abbreviation	Description
PAHs	Polycyclic aromatic hydrocarbons
DCM	Dicloromethane
%	Percentage
GC-FID	Gas Chromatography flame ionization detector
GC-MS	Gas chromatography mass spectrometer
Na ₂ SO ₄	Sodium anhydrous sulphate
K ₂ Cr ₄ O ₇	Potassium dichromate
H ₂ SO ₄	Sulphuric acid
Ag ₂ SO ₄	Silver Sulphate
FeSO ₄	Iron (II) Sulphate
g	gram
μL	Micro liter
μm	Micrometer
mL	Milliliter
cm	Centimeter
°C	Degree Celsius
Na	Naphthalene
Ace	Acenaphthene
Acy	Acenaphthylene

Flu	Fluorene
Ph	Phenanthrene
An	Anthracene
Fl	Fluoranthene
Pyr	Pyrene
Chrys	Chrysene
BaA	Benzo[a]Anthracene
BkF	Benzo[k]Fluoranthene
BbF	Benzo[b]Fluoranthene
BaP	Benzo[a]Pyrene
IP	Indeno[1,2,3-cd]Pyrene
dBahA	Dibenzo[a,h]Anthracene
BghiP	Benzo[g,h,i]Perylene

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ABSTRACT

The main objectives of this study are to determine the concentration and distribution of hydrocarbons (aliphatic and aromatic) in the surface sediment of Kertih River. Eight samples were obtained from eight sampling station from the river. The concentration range of identified total aliphatic hydrocarbon (TAHs) was between $5.9406 \pm 0.25 \mu\text{g}\cdot\text{g}^{-1}$ to $51.5563 \pm 2.77 \mu\text{g}\cdot\text{g}^{-1}$. Aliphatic Compounds of C_{27} , C_{29} , C_{31} were high abundance in almost every station. This suggests that the river received natural inputs especially from the terrestrial plants detritus. The carbon preference index (CPI) values in most of the stations are higher than 3, and this make a prediction about the terrestrial plants are the main sources for the aliphatic hydrocarbons. The range concentration for the polycyclic aromatic hydrocarbon among the stations was between $0.2917 \pm 0.04 \mu\text{g}\cdot\text{g}^{-1}$ to $28.2450 \pm 4.07 \mu\text{g}\cdot\text{g}^{-1}$, with the highest concentration in Station 8, and lowest concentration in Station 1. The identified PAHs with 4-6 rings (high molecular weight) had the high abundance in almost every station. This suggests that the sources for the PAHs may due to the combustion, atmospheric emission and waste discharged from the near by petrochemical industry areas or the airport.

TABURAN HIDROKARBON ALIFATIK DAN AROMATIK PADA PERMUKAAN SEDIMEN DI SUNGAI KERTIH

ABSTRAK

Kajian mengenai taburan serta kepekatan hidrokarbon (alifatik dan aromatik) pada permukaan sedimen telah dilakukan di Sungai Kertih. Sebanyak lapan sampel daripada 8 stesen persampelan telah diambil dari sungai ini. Daripada analisa yang dijalankan ini, didapati julat kepekatan bagi hidrokarbon alifatik yang dikenalpasti adalah $5.9406 \pm 0.25 \mu\text{g.g}^{-1}$ ke $51.5563 \pm 2.77 \mu\text{g.g}^{-1}$ antara stesen. Spesis alifatik C_{27} , C_{29} dan C_{31} paling banyak dikesan hampir di setiap stesen. Ini mencadangkan sumber kemasukan hidrokarbon alifatik ke dalam sedimen adalah berpunca daripada tumbuhan daratan. Selain itu, nilai CPI di kebanyakan stesen adalah melebihi 3, keadatan ini menyokongkan lagi kenyataan bahawa tumbuhan daratan menyumbangkan kandungan hidrokarbon aliphatik di dalam sedimen. Manakala, julat kepekatan hidrokarbon aromatik adalah dalam lingkungan $0.2917 \pm 0.04 \mu\text{g.g}^{-1}$ ke $28.2450 \pm 4.07 \mu\text{g.g}^{-1}$ dengan stesen 8 mencatatkan kepekatan paling tinggi, dan stesen 1 dalam kepekatan yang paling rendah. Hidrokarbon aromatik yang mempunyai 4–6 gelang seperti Benzo[g,h,i]Perylene, Dibenzo[a,h]Anthracene and Benzo[a] Anthracene mempunyai taburan yang paling banyak dan boleh didapati hampir di setiap stesen. Ini memberi gambaran bahawa sumber kemasukkan hidrokarbon aromatik ke dalam sediment adalah daripada sisa buangan kawasan industri dan lapangan terbang serta hasil daripada pembakaran yang tak lengkap.