

EFFECT OF PARTICLE SIZE OF MARINE SEDIMENT
ON HYDROCARBON ADSORPTION

TEH SIEW BEE

FACULTY OF SCIENCE AND TECHNOLOGY
UNIVERSITY COLLEGE TERENGGANU
UNIVERSITI PUTRA MALAYSIA

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KOLEJ UNIVERSITI SAINS & TEKNOLOGI MALAYSIA
21030 KUALA TERENGGANU

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**EFFECT OF PARTICLE SIZE OF MARINE SEDIMENT
ON HYDROCARBON ADSORPTION**

BY

TEH SIEW BEE

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**Department of Chemistry
Faculty of Science and Technology
University College Terengganu
(University Putra Malaysia)
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EFFECT OF PARTICLE SIZE OF MARINE SEDIMENT ON HYDROCARBON ADSORPTION

By

Teh Siew Bee

Approved By:

Supervisor



(Prof Law Ah Theem)

Date : 25/3/2001

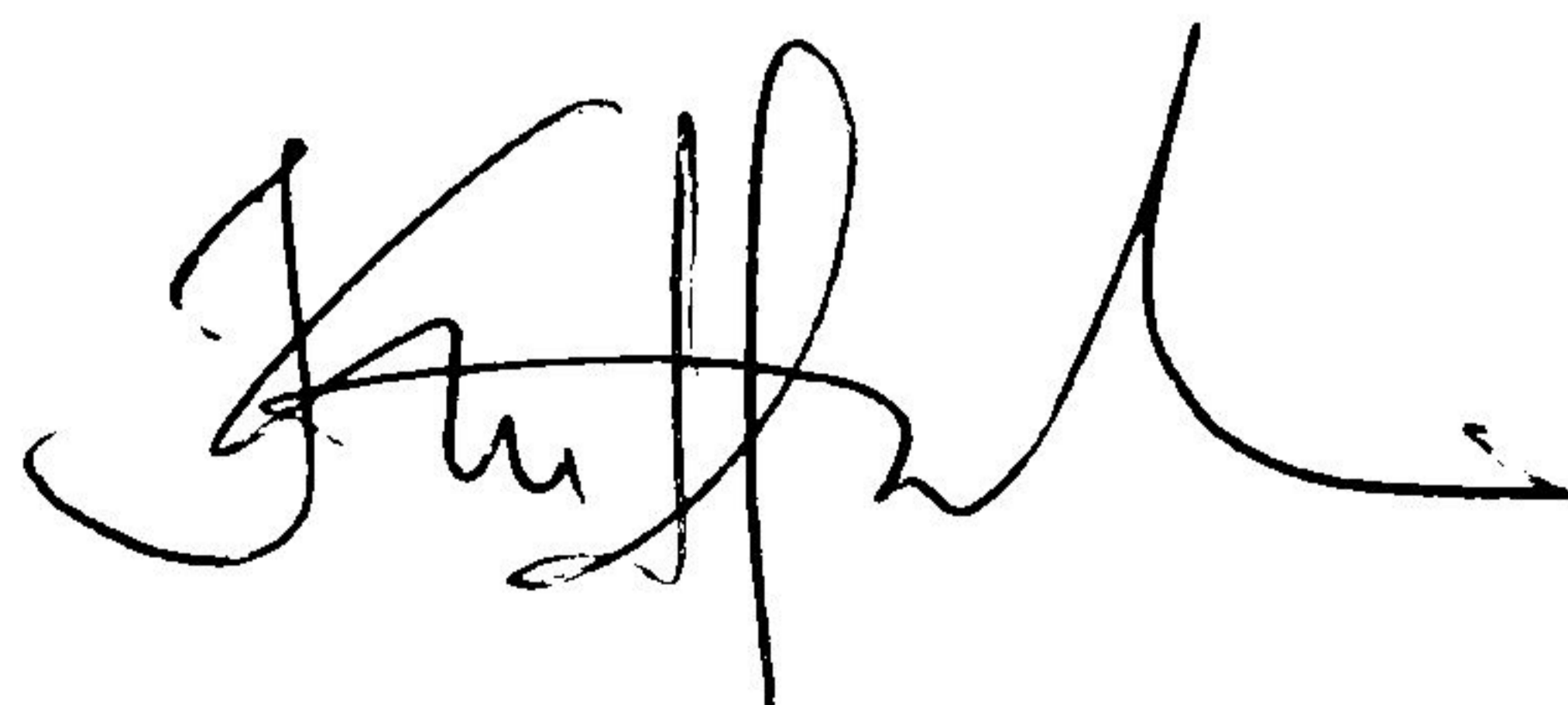
Coordinator



(Puan Marinah Mohd Ariffin)

Date : 25/03/01

Head of Chemistry



(Assoc. Prof. Dr. Ku Halim Ku Bulat)

Date : _____

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ABSTRACT

A study on the adsorption of Water-Soluble-Fraction (WSF) of crude oil on marine sediment was conducted. The rate of adsorptivity varied with the sizes of the sediment. The particles with smaller size tend to absorb more hydrocarbons compared to the larger particles. Thus, smaller particles of the sediment will contain higher content of the hydrocarbons and it will be more toxic than the larger particles to marine benthic organisms. In other word, the hydrocarbon adsorption was inversely proportional to the particle sizes. The average adsorption rate, K , of the WSF oil for the sediment with particle size of 63 μm , 125 μm , 212 μm and 500 μm were $1.053 \pm 0.827 \mu\text{g.g}^{-1}.\text{min}^{-1}$, $0.793 \pm 0.669 \mu\text{g.g}^{-1}.\text{min}^{-1}$, $0.662 \pm 0.402 \mu\text{g.g}^{-1}.\text{min}^{-1}$ and $0.551 \pm 0.328 \mu\text{g.g}^{-1}.\text{min}^{-1}$ respectively. Besides that, the average saturated adsorption of the WSF oil for the sediment with particle size of 63 μm , 125 μm , 212 μm and 500 μm were $41.860 \pm 34.901 \mu\text{g.g}^{-1}$, $40.469 \pm 27.573 \mu\text{g.g}^{-1}$, $36.354 \pm 22.830 \mu\text{g.g}^{-1}$ and $33.089 \pm 18.978 \mu\text{g.g}^{-1}$ respectively. The process of the hydrocarbon adsorption on marine sediment seems to obey the first order rate.

ABSTRAK

Laporan projek ini memaparkan keputusan analisis terhadap penyerapan hidrokarbon oleh sedimen dalam 'Water -Soluble-Fraction' (WSF). Partikel size yang berlainan mempunyai kadar penyerapan hidrokarbon yang berlainan. Partikel size yang kecil berkecenderungan menyerap lebih banyak hidrokarbon berbanding dengan partikel size yang lebih besar. Jadi, partikel size yang kecil lebih banyak mengandungi hidrokarbon berbanding dengan partikel size besar. Oleh itu, partikel size yang kecil adalah lebih racun daripada partikel yang besar. Dengan erti lain, kadar penyerapan hidrokarbon adalah berkadar songsang dengan partikel size sedimen. Purata kadar penyerapan hidrokarbon bagi sedimen dengan partikel size 63 μm , 125 μm , 212 μm , dan 500 μm masing – masing adalah $1.053 \pm 0.827 \mu\text{g.g}^{-1}.\text{min}^{-1}$, $0.793 \pm 0.669 \mu\text{g.g}^{-1}.\text{min}^{-1}$, $0.662 \pm 0.402 \mu\text{g.g}^{-1}.\text{min}^{-1}$ and $0.551 \pm 0.328 \mu\text{g.g}^{-1}.\text{min}^{-1}$. Tambahan pula, purata maksimum penyerapan bagi WSF untuk sedimen dengan partikle size 63 μm , 125 μm , 212 μm and 500 μm masing – masing adalah $41.860 \pm 34.901 \mu\text{g.g}^{-1}$, $40.469 \pm 27.573 \mu\text{g.g}^{-1}$, $36.354 \pm 22.830 \mu\text{g.g}^{-1}$ and $33.089 \pm 18.978 \mu\text{g.g}^{-1}$. Proses penyerapan hidrokarbon bagi sedimen seolah - olahnya seperti tindak balas tertib pertama.