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**DISTRIBUTION OF HYDROCARBON IN DIFFERENT PARTICLE SIZE OF
SEDIMENT IN COASTAL WATER OFF PULAU PERHENTIAN,
SOUTH CHINA SEA**

BY

CHIN KAM YEW

**This project report is submitted in partial fulfillment of the requirements for the
Degree of Bachelor of Marine Science**

**FACULTY OF SCIENCE AND TECHNOLOGY
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PUSAT PEMBELAJARAN DIGITAL SULTANAH NUR ZAHIRAH

ABSTRACT

The hydrocarbon content in each different particle size of sediments from Pulau Perhentian was measured with the fluorescence spectrophotometry. Samples collected during August 2001 shows the content of hydrocarbon in each grain size ($125 \leq x < 212 \mu\text{m}$, $90 \leq x < 125 \mu\text{m}$, $63 \leq x < 90 \mu\text{m}$ and $x < 63 \mu\text{m}$) were 46.396 ± 14.070 , 61.210 ± 32.132 , 59.339 ± 23.310 and $81.391 \pm 39.982 \text{ mg.kg}^{-1}$ dry sediment weight respectively. Whereas the total petroleum hydrocarbons content in the sediments ranged between 1.092 to 48.447 mg.kg^{-1} dry sediment weights. The average hydrocarbons present in the sediments was $29.388 \text{ mg.kg}^{-1}$ dry sediment weights.

The total organic carbon contents in each grain size mentioned above were 22265.97 ± 12468.22 , 23066.75 ± 18084.62 , 30063.97 ± 14126.67 and 31128.58 ± 16205.53 ppm carbon (C) respectively; with ranges between 654.43 to 19207.75 ppm C. The average total organic carbon content in the sediments was 11001.52 ± 6173.18 ppm C.

A significant correlation was observed between the petroleum hydrocarbon content with different particle grain size ($R = - 0.388$) as well as with the total organic carbon in sediment ($R = 0.602$). Distribution of the hydrocarbon content in sediment was influenced by several factors such as the water circulation, total organic carbon (TOC), sediment grain size and some physical parameters of the surrounding water. Biogenic and anthropogenic sources also contribute to the fluctuation of hydrocarbon content in the sediment of the study area. The differences between calculated concentration of total petroleum hydrocarbons (TPH) in each particle size and the actual concentration of TPH in sediment were discussed in this study.

ABSTRAK

Kandungan hidrokarbon dalam sedimen yang berlainan saiz dari Pulau Perhentian telah dianalisis dengan kaedah fluorescence spectrofotometri. Sampel yang telah diambil semasa Ogos 2001 menunjukkan kepekatan hidrokarbon dalam saiz sedimen yang berlainan iaitu ($125 \leq x < 212 \mu\text{m}$, $90 \leq x < 125 \mu\text{m}$, $63 \leq x < 90 \mu\text{m}$ and $x < 63 \mu\text{m}$) adalah 46.396 ± 14.070 , 61.210 ± 32.132 , 59.339 ± 23.310 dan $81.391 \pm 39.982 \text{ mg.kg}^{-1}$ berat sedimen kering masing-masing. Manakala tahap jumlah petroleum dalam sedimen adalah dalam lingkungan 1.092 hingga 48.447 mg.kg^{-1} . Purata tahap hidrokarbon yang hadir dalam sedimen di Pulau Perhentian adalah $29.388 \text{ mg.kg}^{-1}$.

Pada masa yang sama, jumlah tahap organik karbon adalah 22265.97 ± 12468.22 , 23066.75 ± 18084.62 , 30063.97 ± 14126.67 dan 31128.58 ± 16205.53 ppm carbon (C) masing-masing. Manakala tahap jumlah tahap organik karbon berada dalam julat 654.43 hingga 19207.75 ppm C. Purata jumlah tahap organik karbon yang dijumpai dalam sedimen adalah 11001.52 ± 6173.18 ppm C.

Beberapa korelasi yang nyata telah diperhatikan antara hidrokarbon, saiz partikel yang berbeza ($R = -0.388$) dan jumlah organik karbon ($R = 0.602$). Taburan hidrokarbon dipengaruhi oleh beberapa faktor seperti pergerakan air, jumlah karbon organik, saiz partikel dan beberapa parameter fizikal di persekitaran air Pulau Perhentian. Sumber biogenik dan antropogenik juga menyumbang kepada perubahan kandungan hidrokarbon dalam sedimen di tempat kajian. Perbezaan antara kepekatan hidrokarbon kiraan dengan kepekatan hidrokarbon sebenar dalam pelbagai saiz partikel dalam sedimen juga dibincang dalam kajian ini.