Lihat sebelah

HYDROCARBONS IN SEDIMENT OF JOHOR COASTAL WATERS DURING THE PRE-MONSOON AND THE POST MONSOON

By,

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LIST OF ABBREVIATIONS

g	-	Gram
kg	-	Kilogram
l	-	Liter
min	-	Minute
ml	-	Milliliter
mg	-	Milligram
$mg.kg^{-1}$	-	Milligram per kilogram
$mg.l^{-1}$	-	Milligram per liter
ng	-	Nano gram
$ng.g^{-1}$	-	Nano gram per gram
$ng.ml^{-1}$	-	Nano gram per milliliter
M	-	Molar
ppm	-	Part per million
ppt	-	Part per thousand
R	-	Correlation coeffient
R^2	-	Regression coeffient
s	-	seconds
µ	-	Micron
µg	-	Microgram
$µg.g^{-1}$	-	Microgram per gram

$\mu g.ml^{-1}$	-	Microgram per milliliter
µl	-	Microliter
°C	-	Degree Celsius
%	-	Percentage
C	-	Carbon
CH_2Cl_2 / DCM	-	Dichloromethane
HCl	-	Acid hydrochloric
GC	-	Chromatography Gas
Na_2SO_4	-	Sodium sulfate
PAH	-	Poly Aromatic Hydrocarbon
TAH	-	Total Aliphatic Hydrocarbon
TOC	-	Total Organic Carbon

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ABSTRAK

Objektif utama kajian ini adalah untuk mengaji kandungan hidrokarbon dalam sedimen dan pengaruh monsun terhadap kandungan hidrokarbon di dalam sedimen di kawasan perairan Johor. di samping mengkaji tahap pencemaran hidrokarbon di kawasan ini. Kesemua sampel sedimen di ambil dari 30 stesen yang berbeza pada sebelum monsun dan selepas monsun Pantai Timur Malaysia. Kandungan jumlah hidrokarbon ditentukan dengan menggunakan UV spectrophotometer manakala taburan AH dan PAH ditentukan dengan mengunakan GC-FID. Kandungan jumlah hidrokarbon dalam sedimen pada sebelum monsun dan selepas monsun masing-masing berjulat dari 13.755 hingga 52.414 mg/kg sedimen kering dan dari 15.785 hingga 54.100 mg/kg sedimen kering. Dengan ini, boleh disimpulkan bahawa kandungan hidrokarbon dalam sedimen adalah masih kurang daripada 100 mg/kg sedimen kering dan sediment di kawasan perairan Johor belum mengalami pencemaran lagi. Tambahan pula, kajian ini membuktikan bahawa taburan hidrokarbon dipengaruhi oleh monsoon di mana kandungan hidrokanbon dalam sampel tanah selepas monsun adalah lebih tinggi berbanding dengan sampel yang diambil sebelum monsun. Keadaan ini mungkin disebabkan oleh fenomena percampuran oleh ombak dan angin semasa monsun yang menyebabkan hidrokarbon bergabung dengan butiran debris, tanah atau bahan–bahan organik dan tenggelam ke dasar. Kandungan TAH dalam sedimen sebelum monsun di stesen 6, stesen 8 dan setsen 10 masing- masing adalah 21.865 ng/g , 214.728 ng/g and 75.596 ng/g. Manakala, kandungan TAH dalam sedimen selepas monsun di stesen 6, stesen 8 dan stesen 10 masing- masing adalah 1149.784 n/g, 39.406 ng/g and 68.063 ng/g. Di samping itu, kandungan PAH dalam sedimen sebelum monsun di stesen 6, stesen 8 dan setsen 10 masing- masing adalah 11.259 ng/g, 8.312 ng/g and 6.524 ng/g. Manakala,

kandungan TAH dalam sedimen selepas monsun di stesen 6. stesen 8 dan setsen 10 masing-masing adalah 18.714 ng/g. 50.705 ng/g and 57.880 ng/g. Pada masa yang sama. kandungan organik karbon dalam sedimen di kesemua stesen yang dikaji sebelum monsun dan sselepas monsun masing-masing berjulat dari 0.0715 % hingga 0.5035 % dan 0.0625% hingga 0.5784 %. Pekali korelasi menunjukan bahawa tiada perkaitan wujud di antara kandugan hidrokarbon dalam sedimen dan peratusan organik karbon.

ABSTRACT

The main objective of this project is to study the hydrocarbon content in sediments and the influence of the monsoon seasons on the distribution of hydrocarbon as well as to assess the status of hydrocarbons pollution in the Johor coastal waters. The sediment samples were taken at 30 different sites during the pre-monsoon and the post monsoon season of East Coast of Malaysia. The Total Hydrocarbon were determined using the UV spectrophotometer while the AH and PAH compound were determined using gas chromatography with flame ion detector (GC-FID). The total hydrocarbon in sediment during pre monsoon and post monsoon ranged from 13.755 to 52.414 mg/kg dry sediments and 15.785 to 54.100 mg/kg dry sediments respectively. On these bases, the sediments were still below the safety level of 100 mg/kg dry sediment. In addition, the distribution of hydrocarbon contents in sediments of Johor Coastal waters were influenced by the monsoon pattern at South China Sea as the concentration of total hydrocarbon in sediments are higher during post monsoon than pre monsoon. This may due to the turbulence mixing processes by waves and winds that occur during monsoon, which cause more hydrocarbons to incorporate with debris, sediment or organic matter that cause the oil get denser and sink to the bottom. During pre monsoon, the concentration of Total Aliphatic Hydrocarbon (TAH) in sediments at station 6, station 8, and station 10 were 21.865 ng/g, 214.728 ng/g and 75.596 ng/g respectively. Whereas, the concentration of Total Aliphatic Hydrocarbon (TAH) in sediments at station 6, station 8, and station 10 during post monsoon were 1149.784 ng/g, 39.406 ng/g and 68.063 ng/g correspondingly. During pre monsoon, the concentration of Poly Aromatic Hydrocarbon (PAH) in sediments at station 6, station 8, and station 10 were 11.259 ng/g, 8.312 ng/g

and 6.524 ng/g respectively. Whereas, the concentration of Total Poly Aromatic Hydrocarbon (PAH) in sediments at station 6, station 8, and station 10 during post monsoon were 18.714 ng/g, 50.705 ng/g and 57.880 ng/g correspondingly. The TOC content in sediment at all sampling stations during pre monsoon and post monsoon ranged from 0.0715 % to 0.5035 % and 0.0625% to 0.5784 % respectively. The correlation coefficient between the hydrocarbon content in sediment and percentages of organic carbon content is poor.