THE [illegible] AND CHEMICAL COMPOSITION OF PARTICLES AT THE EAST COAST OF PENINSULAR MALAYSIA: A CASE STUDY IN TERENGGANU COASTAL AND OFFSHORE AREAS

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Lihat sebelah

THE ANALYSES OF AIR CHEMICAL COMPOSITION OF PARTICLES AT THE EAST COAST OF PENINSULAR MALAYSIA: CASE STUDY IN TERENGGANU COASTAL AND OFFSHORE AREAS

By

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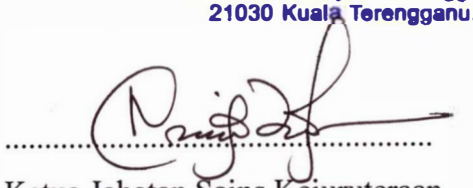

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LIST OF ABBREVIATIONS/SYMBOLS

Abbreviation/symbol	
Br^-	Bromide ion
Cl^-	Chlorine ion
CO	Carbon monoxide
DIW	de-ionized water
DOE	Department of Environment
EC	Elemental Carbon
Fl^-	Fluoride ion
HVAS	High-Volume Air Sampler
GPS	Global Positioning System
IC	Ion Chromatography
mM	milimolar
NAAQS	National Ambient Air Quality Standard
Na_2CO_3	Sodium carbonate
$NaHCO_3$	Sodium bicarbonate
NH_4Cl	Ammonia chloride
$(NH_4)HSO_4$	Ammonia sulfuric acid
NH_4NO_3	Ammonia nitrate
$(NH_4)_2SO_4$	Ammonia sulfate
NO_3^-	Nitrate ion

NO_2^-	Nitrite ion
OC	Organic Carbon
PM	Particulate Matter
PO_3^{2-}	Phosphate ion
SO_4^{2-}	Sulphate ion
PM_{10}	particles smaller than 10 μm
RH	Relative humidity
SO_x	Sulfur oxides
SO_2	Sulfur dioxide
SO_4^{2-}	Sulfate ion
WHO	World Health Organization

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ABSTRAK

Pantai Timur Semenanjung Malaysia mempunyai pelbagai sumber mineral, hasil laut, tempat rekreasi and aktiviti-aktiviti perindustrian yang menyumbangkan kepada masalah pencemaran udara. Kajian ini diwujudkan untuk menyiasat ketujuh-tujuh anion di dalam udara lembap iaitu ion florida, ion klorin, ion nitrit, ion bromida, ion nitrat, ion fosfat dan ion sulfat; di mana anion-anion ini mewakili kawasan aktiviti-aktiviti manusia yang berlainan. Kajian ini bertujuan untuk menentukan dan memperincikan penyebaran kepekatan zarah-zarah di dalam komposisi bahan kimia daripada sumber semulajadi dan aktiviti-aktiviti manusia. Data telah dikumpul di lokasi-lokasi pensampelan yang dipilih adalah berdasarkan kepada kawasan perumahan, kawasan pembinaan dan industri petrokimia yang berdekatan dengan persisiran pantai dan kawasan semulajadi di luar pantai Terengganu dari bulan Disember 2006 hingga Februari 2007. Data telah dikumpul dengan menggunakan alat pengumpul pasif yakni Pengumpul Udara Berisipadu Tinggi (HVAS) dan Pengumpul Udara Persendirian APEX. Pada peringkat analisis, data telah dianalisis oleh *Ion Chromatography* (IC) untuk menganalisis spesis-spesis anion terlarut di dalam bahan kimia. Spesis-spesis anion terlarut ini telah dianalisis dengan menggunakan *Statgraphics Centurion* (Pakej Perisian Statistik). Parameter-parameter berkenaan dengan cuaca yang diambilkira adalah kelajuan angin, arah angin, kelembapan, suhu and kadar air hujan. Parameter-parameter ini telah dianalisa dengan menggunakan perisian WRPlot. Keputusan kajian menunjukkan terdapat perbezaan kepekatan di antara kawasan luar pantai dan persisiran pantai. Tambahan lagi, jumlah komposisi bahan kimia bagi anion adalah lebih tinggi di kawasan luar pantai berbanding dengan bahagian kawasan yang lain. Keputusan yang diperolehi telah memberi maklumat yang berguna dalam penyebaran reruang komposisi-komposisi bahan kimia yang berkaitan dengan kesihatan manusia.

ABSTRACT

East Coast of Peninsular Malaysia has assortment of mineral resources, fisheries, recreation and industrial activities that is contribute to the air pollution problem. This study was designed to investigate the seven anion in the moisture air namely fluoride, nitrite, bromide, nitrate, phosphate and sulphate; which represents different human activities. The aim of this study is to determine and characterise the chemical compositions of particles concentration dispersion from natural and anthropogenic resources. The data were collected at selected sampling locations, which represents natural, dwelling, construction and petrochemical industries area near to the Terengganu coastal area and also the offshore zones from the month of December 2006 until February 2007. The data were collected by using passive air samplers which are the High-Volume Air Sampler (HVAS) and APEX Personal Air Sampler. At the analysis stage, data were analysed by Ion Chromatography (IC) for chemical analysis of soluble anion species. These soluble anion species were then analysed bu using Statgraphics Centurion (Statistical Package Software). The meteorological parameters that were monitored are wind speed, wind direction, humidity, temperature and precipitation. These parameters were analysed using WRPlot software. The results obtained, show the concentration differences between offshore and coastal areas. Furthermore, the amount of chemical compositions is significantly higher at the offshore area compared to the other area. These results provide useful information to the spatial distribution of soluble anion species which can be related to the human health.