Diurnal Change of Volatile Organic Compounds in the Greater Cairo Area

By

Mahmoud Mohamed Nour Eldeen
B.Sc. Science (Chemistry), Cairo University, (١٩٩٦)

A Thesis Submitted in Partial Fulfillment
Of
The Requirement for the Master Degree
In
Environmental Science

Ain Shams University
Institute of Environmental Studies and Researches
Dep. Of Environmental Basic Sciences

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Approval Sheet

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ABSTRACT

Air pollution represents an environmental problem of public concern due to its negative effect on human health.

This investigation aims at investigating the concentrations of some hazardous compounds namely: volatile organic compounds VOC,s in air samples collected from some locations in Greater Cairo area . These locations were selected to represent some regions of high traffic intensity and other industrialized regions. Two methods for samples collection were utilized: (I) the US EPA Environmental Protection Agency (EPA TO١٥A) in which a stainless steel canister pump ventilated sampling line, and (II) the use of organic vapour monitors passive samplers. Analyses of the samples were preformed using GC/MS and gas chromatograph equipped with flame ionization detector .The results obtained revel the following:

١-Volatile organic compounds were detected in high concentration in some regions in Greater Cairo area especially those with high traffic intensity both indoor and outdoor.

٢-In addition to traffic flow, there are other meteorological factors causing diurnal variations in the concentration of VOC,s.

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List of abbreviation

DNPH: dinitrophenylhydrazine

US EPA: United Stats Environmental Protection Agency

ppm: part per million

ppb: part per billion

ppt v: part per trillion volume

VOCs: volatile organic compounds

BTEX: (benzene toluene xylene)

MTBE: (Methyl Tertiary Butyl Ether)

GC/MS: gas chromatography / mass spectroscopy

GC/FID: Gas Chromatography / Flame Ionization Detector

HAPs: Hazardous air pollutants

CMB: chemical Mass Balance

NMHC: Non Methanic Hydro carbon

PMF: Positive Matrix Factorization

PCO: Photo catalytic oxidation

WHO: World Health Organization

HPLC: High pressure liquid Chromatography

ECD: electron Capture detector

LOQ: limit of quantitation

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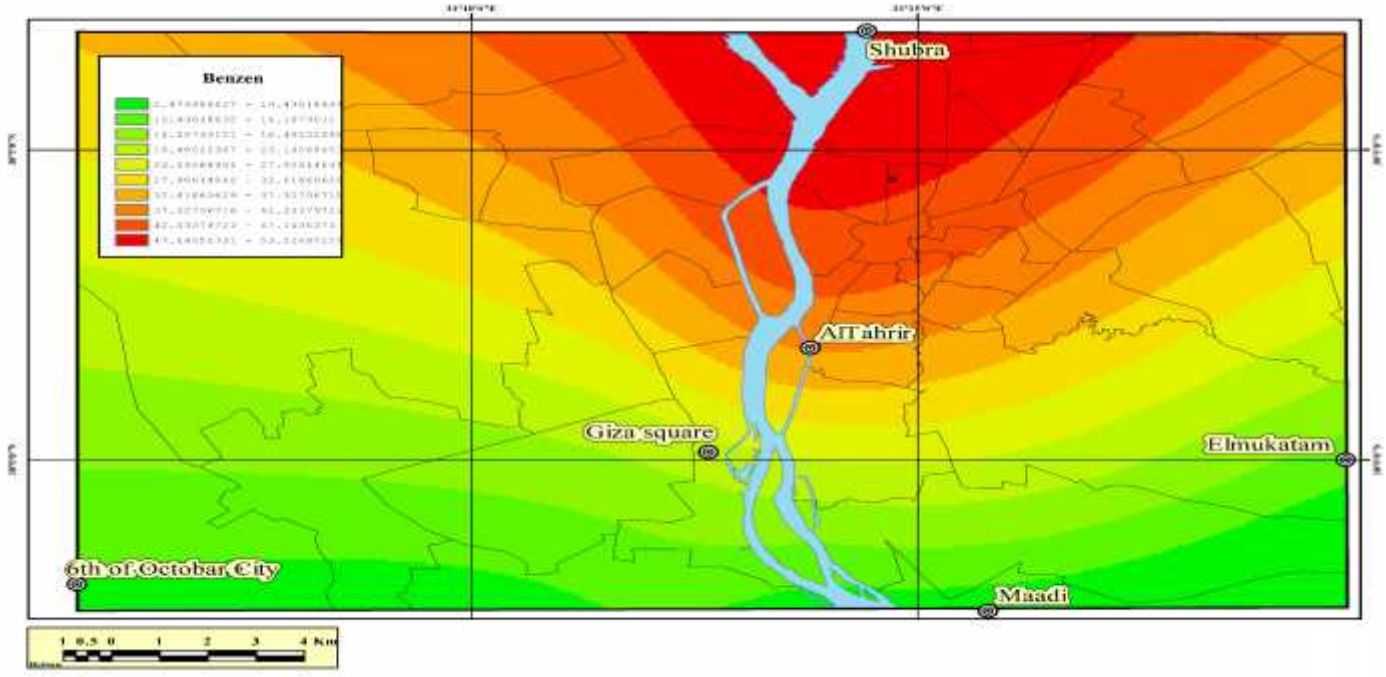

Fig.٣,١١ Benzene concentration in all sampling sites in winter time