

Composition of Air Pollutants in Selected Areas of Lagos, Nigeria

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ABSTRACT: The composition of air pollutants in Ojuelegba Motor Park, Oshodi Motor Park and Festac Town Residence was carried out within 24 hours each using an automated gas detector of Crowcon Gasman models 89/336/EEC (handheld) with operating temperature of between 20⁰C to 50⁰C. The results obtained showed upsurge level of CO, NO, SO₂ and volatile organic compounds in Ojuelegba Motor Park and oshodi Park compared to the permissible level of 50ppm (CO), 0.8ppm (NO₂), 0.5ppm (SO₂) and 250µg/m² (VOC), However, the levels of these gases were normal in Festac Town Residence. These results have shown the high level of environmental and health risk that people around Ojuelegba and Oshodi motor parks are exposed to. Thus, there is urgent need to give environmental issues more attention in the governmental policy and effort should be made to control industrial efflux, smoking attitudes, refuse burning and use of old vehicles as these may be contributory to the upsurge of environmental gases and consequently have serious impact on health and environment.

Key Words: Immune-responses, cigarettes, alcohol, Nigeria.

INTRODUCTION

Rapid industrial development and growth of cities throughout the world have led to the recognition and increasing understanding of the inter relationship between pollution, environment and public health. The WHO estimates that 4.6 million people die each year from causes directly attributed to air pollution (Davis, 2002). Several meetings have been held since the 1990's on the potential threats of global warming across the globe. This major environmental issue affects both the developed and developing countries. However, Africa remains the continent with the most need and the least able to cope with the consequences of climate change and climate variability. A seasonal variation in concentration of air pollutants and poor air quality has also been observed in Upper Silesia (Bostrom et al, 1994; Sawicki, 1977 and Chorazy et al, 1994).

A recent report released by United Nation framework Convention on Climate change (UNFCCC) painted a vivid picture of calamities that would befall developing countries between now and 2050 if the recent levels of green house gases (GHG) emission are not reduced by at least 50%.

Worldwide more deaths per year are linked to air pollution than to automobile accident. The concept of adverse effects of air pollution in lungs, skin, and eyes of humans have recently been documented (Ahrens, 2003). Air pollution threatens health and welfare of about one half of the world's population (UNEP/WHO, 1993). Direct causes of air pollution related deaths include aggravated asthma, bronchitis, emphysema, lung and heart diseases and respiratory allergies. An increase in concentration of air pollutants has been associated with cigarette smoking (Grimmer, 1979) and diesel exhaust (Pershagen, 1990) which are known causes of biological effect (Hemminki and Pershagen, 1994) and impaired homeostasis (Rober et al, 2002).

The major environmental gases that pollute the environment include carbon dioxide, nitrogen oxide, sulphur dioxide and volatile organic compounds. There could also be compounds in the air that are potential carcinogens (IARC, 1990). Thus, persistent exposure to

these environmental gases above the tolerable/ permissible level will ultimately dispose the subjects to health hazards.

Finally, Lagos State is a megacity with a population of over 10million people with heavy traffic congestion and vehicular emission which could lead to serious air pollution. In view of this fact, the impact of over concentration of industries and vehicles in Lagos on the air pollution is hereby evaluated in designated areas.

MATERIALS AND METHODS

The measurement of the level of air pollutants was carried out with in 24hours each in Oshodi Motor Park, Ojuelegba Motor Park and Festac Town residence using a Crowcon gasman models 89/336/EEC (handheld). Oshodi and Ojuelegba motor parks are strategic parts with heavy vehicle concentration due to so many motor parks within these major parks and Festac Town Residence was taken as control due to less vehicle and industrial concentration. The procedure of operating Crowcon gasmen model is highly sensitive and automated. It is a gas detector which can continuously monitor the level of gases with operating temperature of between 20⁰c to 50⁰c.

The instrument was operated by pressing the large button on the machine to switch on the instrument and it automatically test all the segments of the machine for 5 second and subsequently displayed the battery condition for 5 second. The instrument then displayed numerically the appropriate levels of CO, NO, SO₂ and volatile organic compounds in the selected areas. The results obtained were graphically illustrated.

RESULTS

The results in Figure I showed the different concentration of environment gases in different sections of the park in Ojuelegba Bus Stop. It showed that the concentration of carbon monoxide is highest in Eko-Idumota/Ijora Park with 13ppm followed by Oyingbo Park with 12ppm and Masha/ park and Opebi/Allen Park had 7ppm and 6ppm respectively. The concentration of nitrogen oxide was minimal in Opebi/Allen Park, Oyingbo Park and Masha/kilo park with values of 2ppm each. Eko-Idumota/ijora Park has a lower concentration of 1ppm.

The concentration of sulphur dioxide was not appreciable in almost all the parks except Eko-idumota/Ijora Park that had 1ppm. The concentration of volatile organic compound was highest in Masha/Kilo Park with 2ppm.

Figure 2 showed the results of environmental gases in different parks in Oshodi Bus Stop. It was observed that the concentration of carbon monoxide was highest in Ilupeju Park with 17ppm while Ibadan/Mile 2 Park had 6ppm. The concentration of nitrogen oxide was highest in Alagbado/Ijaye Park and Ilupeju Park with values of 6ppm. Ibadan/Mile2 Park had the least concentration of 2ppm. Almost all the parks had no appreciable sulphur dioxide except Alagbado/Ijaye Park with 2ppm.

The concentration of volatile organic compound was minimal in Alagbado/Ijaye park and Ibadan /mile 2 park with values of 1ppm, while Ilupeju and Ikotun park had no appreciable value.

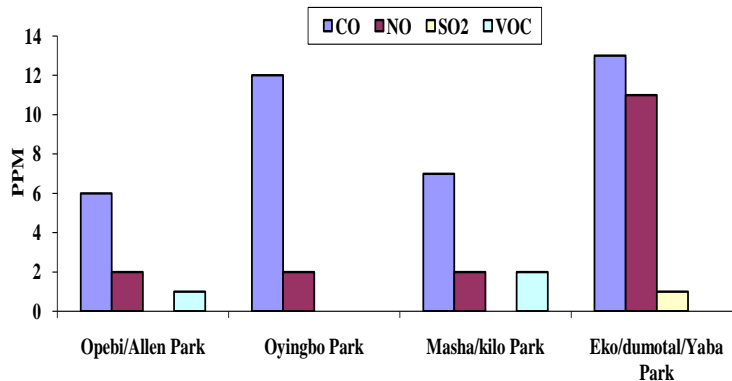


Figure 1: Concentration of environmental gases at different parks of Ojuelegba Bus Stop

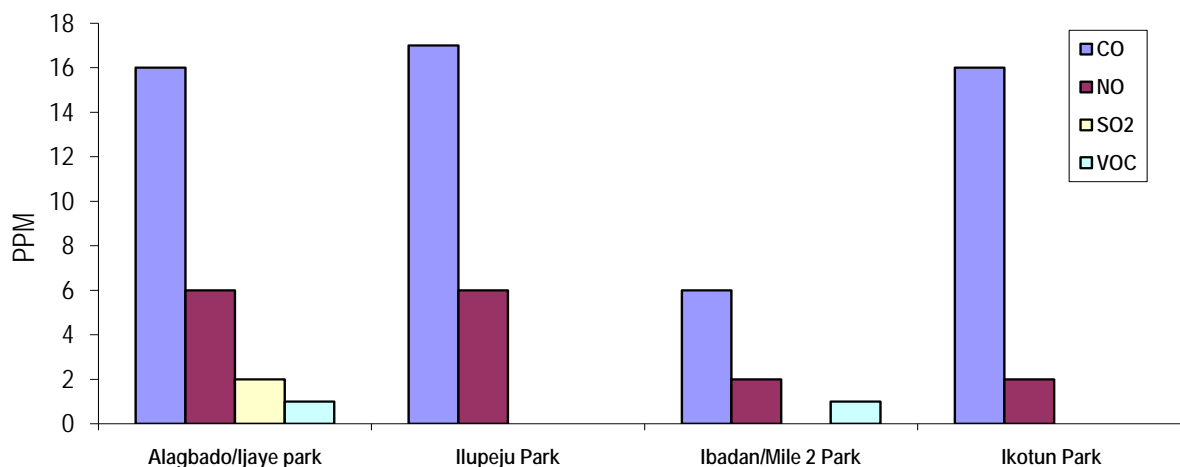


Figure 2:
Concentration of environmental gases at different parks of Oshodi Bus Stop

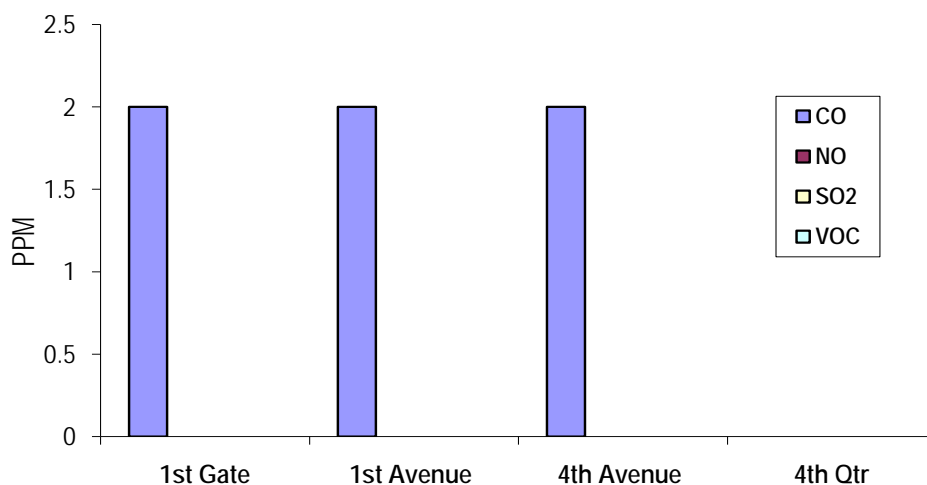


Figure 3:
Concentration of environmental gases of different parks of Festac Town residence

Figure 3 showed the results of environment gases at different points in Festac Town. The concentration of carbon monoxide was minimal compare to Ojuelegba and Oshodi Parks in all the areas of Festac with 2ppm. The value of nitrogen oxide was zero and unappreciable value of volatile organic compound was obtained.

DISCUSSION

The upsurge levels of environmental gases have been known to be a major environmental health problem that

threatens the health and welfare of both developed and developing countries. Results obtained from this study has demonstrated high level of these environmental gases in Ojuelagba and Oshodi Motor Parks compared to the permissible level of 50ppm (CO) 0.8ppm (NO₂), 0.5ppm (SO₂) and 250µg/m³ (VOC) as stated by FEPA 1992. This report is in accordance with the work of Chorazy et al (1984) and Bostrome et al, (1994) that showed variation in concentration of air pollutants and poor air quality in upper Silesia. These abnormal levels of gases could be as a result of diverse sources which may constitute the main environmental problem in

these areas. However, automobile exhaust, cigarette smoking, industrial efflux and refuse burning around these areas may be contributing factors for upsurge level of these gases as demonstrated in the work of Grimmer (1979) and Hemminiki et al (1994). Thus, the result obtained in Festac Town residence area showed approximately permissible level of these gases. This could be as a result of limited pollution from automobile, cigarette smoking and refuse burning in this area.

The work of Folinsbee, 1992, and Waldbeth, 1978 have shown the adverse effect of environmental pollution on health. These effects have been documented to range from respiratory, cardiovascular to central nervous system effects. More so, upsurge level of environmental gases have been known to result in global warming and a resultant effect in ozone layer depletion, acid rain and melting of the Ice Polar Region which could however lead to environmental disaster if not quickly managed.

In view of the above, environmental issues should be given more attention in the government policy and effort should be made to control industrial air efflux, smoking attitudes, refuse burning and use of old vehicles for transportation services.

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