

E2-44: Status of air pollution caused by vehicle emissions in Colombo city

J A P Mathes¹, A W J Karunasinghe¹, H D Gunawardhana²

(¹Environmental Tech Div, CISIR, Colombo 7, ²Dept of Chemistry, Univ of Colombo, Colombo 3)

The concentrations of air pollutants in the urban air of the city was determined to recognise the depth of their impact.

Seven sampling places were selected and monitoring was carried out for suspended particulate matter (total dust and fine dust), lead (Pb), carbon

monoxide (CO), sulphur dioxide (SO₂), total hydrocarbon (THC), non-methane hydrocarbon (NMHC) and methane (CH₄) using standard methods.

The methodologies used were : for TSP - High volume air sampling (Gravicon VC 25 Strolein instruments), Pb - Colormetric dithizone procedure, CO - electro-chemical sensor - portable CO guard (Comowarn, Drager), SO₂ - UV/Fluorescence detection - Ambient SO₂ monitor (Horiba), THC - NMHC and CH₄ - Flame ionization detection - Ambient HC monitor (Horiba).

Passing traffic was determined using tally counters during the period of measurement at the sampling sites.

The results indicated that the vehicular traffic along the major roads like Maradana Road, Reid Avenue, Galle Road, Lotus Road constitute about 41,770, 38,800, 37,700, 34,650 vehicles respectively during a 12 h period of a day. The related pollutant concentrations in the air in such traffic systems is as follows, during dry weather periods:

<i>Pollutant</i>	<i>Grand Mean Concentration</i>	<i>Range</i>
TSP -	404 $\mu\text{g}/\text{m}^3$ (8 h)	100 - 700 $\mu\text{g}/\text{m}^3$
Pb -	0.415 $\mu\text{g}/\text{m}^3$ (8 h)	0.01- 2.0 $\mu\text{g}/\text{m}^3$
CO -	4.0 ppm (3 h)	2 - 25 ppm
SO ₂ -	0.0119 ppm (3 h)	0.0045 - 0.054 ppm
THC -	2.7 ppm (3 h)	2 - 5 ppm
NMHC -	0.83 ppm (3 h)	0.2 - 3.00 ppm
CH ₄ -	1.9 ppm (3 h)	1.8 - 2 ppm

The values for TSP and NMHC are at higher level and exceed the standards of 150-230 $\mu\text{g}/\text{m}^3$ (WHO) and 0.24 ppm (3 h) (USEPA) respectively. The pollution by Pb, CO, SO₂, has a greater effect on the urban air quality.

CH_4 is distributed uniformly in the ambient air of the city as the average of 1.9 ± 2.0 ppm varies in a range of 1.8 - 2.0 ppm.

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