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Particulate Pollution and Ratio of SPM: PM10:PM2.5 in Colombo Atmosphere

H D S Premasiri*, R P Samarakkody, C J Annakkage and G B M A Basnayake
Environmental Division, National Building Research Organization, 99/1 Jawatta Road, Colombo 5

Being a capital city close to the sea in a tropical country, Colombo is more vulnerable to particulate pollution i.e. Suspended Particulate Matter (SPM) in ambient air. This particulate can exit as dust, smoke or aerosol in sizes ranging from 0.001 μm to 100 μm. With the environmental health point of view the particulate less than 10 μm in diameter (coarse particulate - PM10) and particulate less than 2.5 μm in diameter (fine particulate - PM2.5) are more important since the morphology of ambient particulate is not uniform or defined.

Monitoring of the particulates, especially in Colombo is not new. Continuous PM10 monitoring data over a period of last five to six years reveals that the particulate in Colombo atmosphere is in an increasing trend. Monitoring of SPM and PM2.5 was done in parallel to PM10 monitoring to compare the levels and data show that the average SPM:PM10:PM2.5 ratio is 4 : 3 : 2 which gives that more than 70% of the Suspended Particulate Matter is in the form of PM10 and out of which 65% is PM2.5, which is considered as more toxic to human health. It also revealed that black smoke generated mostly by the combustion of fossil fuels and ambient particulate lead (Pb) is concentrated in this fine fraction of PM2.5. Sea spray is mainly concentrated in coarse fraction, which is in between 2.5 - 10 μm in diameter.

Continuous monitoring data at Fort, Colombo 11 and Meteorological Department site at Bauddhaloka Mawatha, Colombo 7, indicated that the PM10 at Fort is about 40% higher compared to that of Meteorological Department. It also indicates that the seasonal climatic changes directly influence on the level of PM10 at both locations. A maximum concentration of PM10 ranging 120 - 160 $\mu g/m^3$ occur in North-East monsoon at Fort when compared to the lower range from 60 - 70 $\mu g/m^3$ in South-West monsoon. At Meteorological Department, the upper range is 60 - 70 $\mu g/m^3$ in North-East and the lower range is 30 - 40 $\mu g/m^3$ in South-West. The annual average of PM10 at Fort, Colombo 11 in year 2000 was 84 □g/m^3 and at Meteorological Department, Colombo 07 was 54 $\mu g/m^3$. These values could be compared with the US-EPA standards for the annual average of 50 $\mu g/m^3$ for PM_{10}.

*nbro@sltnet.lk Tel: 011 2588946