

MONITORING AIR POLLUTION LEVELS IN KANDY CITY USING LOW COST AIR SAMPLING TECHNIQUES

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Abstract

Air quality in cities of Sri Lanka has been rapidly deteriorating due to excessive urbanization and the rapid increase in motor vehicles. Therefore, regular monitoring of air quality is important in major cities although it is impossible due to high cost involved in automated monitoring stations. The city of Kandy, which is situated in a valley, is expected to have a higher degree of pollution owing to its geographic location. Therefore, attempts were made to monitor air quality in Kandy city using low cost, environmentally friendly passive & active sampling methods to analyze three gaseous pollutants; NO_2 , SO_2 , and O_3 and particulate matter.

In the field, weekly samples were collected from two stations during the sampling period from February 2002 to September 2004 using passive samplers and the diurnal variation was also studied on hourly samples using active sampling methods. The data reveal that NO_2 , SO_2 and O_3 analyzed during the sampling period in Kandy exceeded the recommended Sri Lankan standard on about 3%, 45% and 30% occasions respectively. Hourly concentrations obtained range from 0.0005 - 0.158 ppm (NO_2), 0.019 - 0.119 ppm (SO_2) and 0.01 - 0.125 ppm (O_3). High levels of SO_2 concentrations were experienced with high vehicular traffic hours. Particulate matter (PM10) was in the range of 215.87 - 2287.60 $\mu\text{g}/\text{m}^3$. The analyzed data revealed an inverse relationship between, nitrogen dioxide and ozone while sulfur dioxide shows a direct relationship to traffic volume.

According to the calculated air quality index (AQI) the air quality is not good for human health on 66 % occasions in Kandy. Among the values of four pollutants analyzed in the Kandy city, particulate matter is the dominant pollutant, while SO_2 is the second pollutant that in term of their exceedance of the air quality standards.