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A CASE STUDY

Analysis of air pollutants by deducing mean, SD, frequency distribution of data and also predicting correlation between common gaseous exhausts and particulates

■ D. SARALA THAMBAVANI AND J. MAHESWARI

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SUMMARY: Urbanization and industrialization have resulted in rapid deterioration of India's air quality. In view of this, monitoring was conducted in Virudhunagar town which is known as trade centre of Tamil nadu. In this study area, three sampling points selected for the analysis were residential (Site1), heavy traffic (Site 2) and industrial area (Site 3). Air quality at different selected locations in study area was analyzed 24/8 hrs basis throughout the study period (Dec. 2010 to May 2011).Monthly average and standard deviation values were calculated for major air pollutants like, PM_{10}, $PM_{2..5}$, $SO_{x,}$ NOx and box plots showed the variation of pollutants among the sites about the mean value. Histogram also established for pollutants showed, frequency distribution for each pollutant. The correlation study of the gaseous pollutants (SO_x and NOx) with particulate pollutant PM_{10} was reported and the correlation of NOx with PM_{10} were found to be significant .From the average concentrations of PM_{10}, $PM_{2.5}$, SO_x, NOx in ambient air in Virudhunagar indicated probably that particulate matter such as PM_{10}, $PM_{2.5}$ in excess may cause irritation, throat infection and increasing allergy diseases.

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Key Words :
$PM_{10,}$ $PM_{2.5,}$ $SO_{x,}$ NOx, Correlation, Air pollutants

Author for correspondence :
D. SARALA THAMBAVANI
Department of Chemistry, Sri Meenakshi Govt College for Women, MADURAI (T. N.) INDIA
E-mail: slp.aicrpam@gmail.com

See end of the article for **Coopted authors'**

Air pollution is the serious problem of our environment and threat to life and human health .Transportation is the major source of air pollutants in towns and cities. Among the various pollutants emitted from vehicles like NOx , $SO_{x,}$ suspended particulate matter (PM_{10}), respirable particulate matter ($PM_{2.5}$) were primary pollutants and are harmful to the living beings. Also, urbanization and industrialization lead to formation of oxides of sulphur and oxides of nitrogen. As a result of this, the quality of the environment gradually deteriorated .NOx and SO_x if present in excess in ambient air, affect the respiratory tract causing irritation and increasing air way resistance (Parida *et al.*, 2003).

Particulate matter has both natural and anthropogenic sources. Natural sources of primary particulate matter include windblown soil and material particles, volcanic dust, sea salt spray, biological materials such as pollen spores and bacteria and debris from forest fires. Wind blown agricultural soil and dust from roads, construction sites and quarrying operations all contribute particulate pollution .It may include a broad range of chemical species including elemental and organic carbon compounds ;oxides of silicon ,aluminum and trace metals ,sulphates ,nitrates and ammonia (Sharma and Pravez, 2003). Several investigators (Mohanty, 1998 and Schwartz, 1994) have studied the chemical composition of gaseous pollutants in different parts of India. Therefore reports on SO_x and NOx get associated with particulate matter.

Therefore, the objective of the present study was to characterize estimate and find out correlation of particulate matter with gaseous air