

Research Paper :

Suspended particulate matter and zinc concentration in ambient air at different traffic junction of Madurai city

■ **D. SARALA THAMBAVANI AND M. VIDYA VATHANA**

See end of the paper for authors' affiliations

Correspondence to:

**D. SARALA
THAMBAVANI**

Department of Chemistry,
Sri Meenakshi Govt. Arts
College (W), MADURAI
(T.N.) INDIA

ABSTRACT

As industrialization and urbanization is increasing, the concentration of smoke, dust and ash are increasing in the ambient air and the natural environment is in deterioration. Particulate matter and zinc monitoring is conducted in an urban area of Madurai in a state of Tamil Nadu. The study is carried out in three sites namely industrial, traffic and residential area based on the activities. It is selected to determine the variation in the concentration levels. This study focuses the key air pollution problem arising from industrial pollution. Data analysis of suspended particulate matter and zinc metal concentration showed the significant differences between all the concentration of pollutants and at all three sampling sites. The genesis of urban air pollution is mainly due to anthropogenic activities, including industrial pollution. Air pollution cause negative impact directly or indirectly on human beings, vegetation, climate and buildings. The present study is carried out for useful planning and control measures of air pollution in traffic and industrial area to avoid air quality deterioration.

KEY WORDS : Particulate matter, Zinc, Air pollution, Air quality deterioration, Industrial pollution

How to cite this paper : Thambavani, D. Sarala and Vathana, M. Vidya (2011). Suspended particulate matter and zinc concentration in ambient air at different traffic junction of Madurai city. *Asian J. Exp. Chem.*, 6 (2):93-101.

Received : 24.10.2011; **Revised :** 10.11.2011; **Accepted :** 18.11.2011

Air pollution level from industrial sectors are increasing at an alarming rate in many developing countries, including India. Vaisanen (1986) and Wen et.al, emphasized that the emissions of air pollutants from industries have already led to damages in natural communities and environment round the world. Various effects have been made for environmental restoration in India, but still it seems to be a formidable task. Degradation of air quality, particularly in urban areas of developing countries, is one of the most alarming problems of modern civilization. Anthropogenic activities release a variety of gaseous and particulate matters to the atmosphere (Yadav and Rajamani, 2003). The response reaction by metals includes the changes in growth and various metabolic processes of plants (Lycholat and Bilchuk, 1998). Increasing human influences on the environment, especially pollution loadings have caused negative changes in natural ecosystems; its biodiversity, structure and productivity (Shparyk and Parpan,2004).

Heavy metals are predominately transferred as molecules or particulate matter via the atmosphere, mostly at large scales. Focal points of metal emissions are

congested urban areas with high densities of industries and traffic (Komarnicki, 2005).

Heavy metals are extremely persistent in the environment, as they are non-biodegradable and non-thermo degradable and thus readily accumulate to toxic levels (Sharma *et al.*, 2007). The biota requires heavy metals in trace amounts but may be sensitive to higher concentration of metals (Rout *et al.*, 2001). Heavy metals have been the object of many studies since they are persistent and belong to the most widely dispersed industrial pollution (Carreras and Pignata, 2002). Several aims have been pursued such as the impact of heavy metal pollution on natural or urban ecosystems, but very few studies have been conducted on accumulation of heavy metals from atmospheric pollution.

The main focus of this work to determine suspended particulate matter (SPM) and zinc (Zn) present in the atmosphere. The zinc burden of environment is related to industrial and vehicular pollution. Zinc occurs naturally in air, water and soil (Lindroos *et al.*, 2007), but as a result of human activities, its concentration are rising unnaturally. In light of the above, the present work was undertaken to