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MOINTORING OF AIR QUALITY IN TERMS F RESPIRABLE PARTICULATE MATTER – A CASE STUDY

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ABSTRACT

As Ariyalur is a land of limestone, the cement industries flourishes to maximum resulting in air pollution. The present study is concerned with the determination of total respirable particulate matter (TRPM) concentration at different locations of the Cement city. The experiments were carried out for a period of 3 months, i.e., from January 2006 to March 2006. the analysis results of air quality was studied. It was concluded that the maximum concentration of TRPM was recorded in vellalar street and a minimum concentration of TRP was noted at the college campus. Thus it is clear that the values are higher than the prescribed standards there by it is impartment that the control measures must be taken to check the air pollution.

INTRODUCTION

Air pollution may be broadly defined as lthe presence of one or more contaminants like dust, smoke, must and odour I the atmosphere which are injurious to human beings, plants and animals or which unreasonably interfere with the comfortable enjoyment of life or property. It may be described as 'The imbalance in quality of air so as to cause adverse effect on the living organisms existing on earth".

Air pollution seriously damages material resources of the cities, such as building and various works of arts, vegetation and corrosion of materials. It is broadly due to particulate matter dispersed in it or gaseous pollutants completely miscible with it in all proportion.

Dusts	-	(1-100μ)
Aerosols	-	(< 1 μ)
Smoke	-	(0.01 - 1μ)

Fumes, mists, fog, smog all contribute to particulate matter. Gaseous pollutants such as SO_2 No_x CO_2 etc.,

Dispersed in air are also major sources of air pollution. Environmental problems have required global proportion steps are dong taken world over to check and proverb environmental pollution. Cement industry in India ranks 5 the in the world to day (Mohanraj *et al*. 2005)

Hence, it is essential to check the air quality as we are dependent upon its quality to have a good standard of life. The standards prescribed by NEERI, (1991) in terms of No_x has been tabulated in Table.1

MATERIALS AND METHODS

METEROLOGICAL PARAMETERS

Temperature

March to June is the summer season in which the

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daily maximum temperature is 39.5°to 42.80°. On set of monsoon brings relief to the region. During the north east monsoon between October and December the mean daily maximum temperature varies from 33.3° to 36.7°C. The Coolest month is December, January and February when the minimum temperature drops to 15.6°C.

Humidity

The relative humidity varies from 30 to 78% in summer and from 40 to 97% in the monsoon months. The area is dry during greater part of the year. Humidity is high during the north east monsoon period of October, November & December.

Wind velocity & Wind direction

Win velocity varies from 10 mk/hr. A macimum velocity of 129 Km/hr was recorded during the cyclone of May 1995. cyclone weather is encountered almost every year during the north east monsoon period (NEERI,1991).

Table 1. Ambient air quality Indian standard (micro gram/m^3)

Area	Spm	SO_2	NO_x	CO
Industrial area	500	120	120	5000
Residential and rural area	200	80	80	2000
Sensitive	100	30	30	1000

MEASUREMENT OF NO_x

The Survey included five sites selected according to the location of mining, non mining and residential sources which include (1) College campus (2) Anna nagar (3) Maruthi nagar (4) Railway gate (5) Vellalar Street. Hence, it is possible to use the High volume gas sampler for gaseous sampling simultaneously. The gaseous. Sampling kit (available as an attachment) it connected to nozzle in the hoper. The air is bubbled through standard solutions in the impingers, at a flow rate of 0.5 to 1 LPM for destined duration. The range of analysis is o.01 to 1.5µg Nitrogen id oxide/mL, with 30mL absorbing reagent and sampling. Rate of 200 ml/min for 24 hous, the range of the method is 20 to 740 µg/m^3 (0.01 to 0.4ppm) Nitrogen dioxide. For the analysis of the methods followed was modified Jacobs muchnerser method (NEERI, 1991).

RESULT AND DISCUSSION

The meterological parameters have been tabulated in table 2. The temperature has shown not much variation as the period of study happens to be January to March. The highest humidity recorded was about 74% and the minimum was about 39% the wind velocity has ranged about 42 km/hr both during the morning similar results have been reported day and night hours.

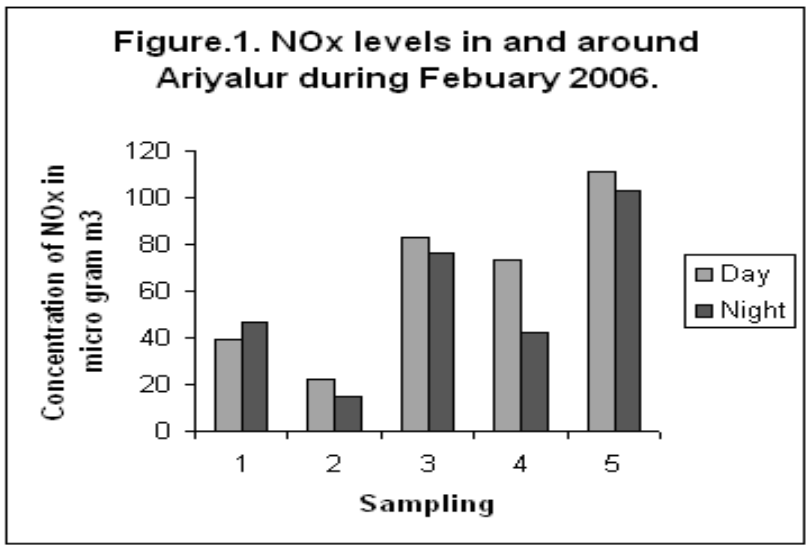
No_x reacts with the atmospheric hydrocarbons in the presence of Sunlight, so that its concentration is lowest during the afternoon hours; it is also stated

Table 2. Micrometerological parameters in study area

S.No.	Area	Temperature		Humidity (%)		Km/Sec	
		Day	Night	Day	Night	Day	Night
1.	College Campus	28°C	28°C	39.87	60.25	759	759
2.	Anna Nagar(N)	29°C	29°C	63.62	71.0	759	758
3.	Maruthi Nagar(E)	28°C	28°C	59.62	72.37	760	760
4.	Railway Gate(W)	29°C	29°C	60.37	74.25	758	757
5.	Vellalar Street(S)	30°C	30°C	53.75	72.87	757	757

Table 3. Summary of NO_x level in around Ariyalur during Feb' 2006

S.No	Area	Location	Value of NOx in day time (µg/m^3)	Value of NOx in Night time (µg/m^3)
1.	College Campus	Centre	39	47
2.	Anna Nagar	N	22	15
3.	Maruthi Nagar	E	83	76
4.	Railway Gate	W	73	42
5.	Vellalar Street	S	111	103



that Ozone concentration is the highest during this period which however, cannot be substantiated by the present study, as Ozone was not estimated.

The highest values of No_x recorded in the study at the Vellarlar street during day time i.e., 111 µg/m^3 and during night time i.e., 103µg/m^3. Lowest means of NO_x Values as been recorded in the Anna nagar during Day time i.e., 22 µg/m^3 and in night time i.e., 15µg/m^3 (Table 3 Fig.1)

During the period of air sampling i.e., Feb 2006 levels of NO^x during day time & Night time, were higher than the standard prescribed by NEERI. Out of the sampling stations Anna nagar has recorded lesser NO_x values during the day and night time. NO_x Levels in the maruthi Nagar and railway gate were slightly higher than the standard during the day time. But other wise in the sampling stations college campus which are located centre of sampling sites.

Though the wind during the period of estimations was pre dominantly form north east, the dispersal of pollutants namely NO_x was very higher in the sampling stations located at the east west and north direction with respect to the Anna nagar and the NO_x level was lesser only in the sampling station located in the northern direction.

Similar results has been reported by Sharma *et al*. 1995.

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