Determination of Gaseous Contamination in Air Around Akaltara Region Chattisgarh State.

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Abstract : This study has been conducted to determination of gaseous contamination in air around akaltara region Chattisgarh.The Chemical industries around local area akaltara region emitted harmful and hazards gaseous in air lead to causes respiratory diseases.Symptom appear such as headache,nausea,vomitting,eye burn,chest pain,wheezing,coughing.Comparing the results of toxic and harmful gaseous in air around akaltara region by using atomic absorption spectrometer.carbon monoxide,sulphur dioxide,nitrogen dioxide in air around akaltara region considerably crossed permissible limits.Overall,this study indicates that's Air around akaltara region chattisgarh are contaminated by Hazards chemical industries

Keywords: Toxic,Hazards substance,respiratory diseases

I. INTRODUCTION

Air pollution consists of a mixture of solid particles and harmful gases in the air including Car emissions, chemicals from factories,soot,dust and suspended par ticle. Ozone, a gas, is a major contributor of air pollution in cities.

When ozone contribute airpollution, it is also called smog pollution. Some air pollutants are harmful & poisonous. Inhaling

them can increase the chance you'll face health problems. People with heart or lung disease, older adults and children are at greater chance from air pollution. Air pollution is not just outside rather the air inside buildings can be polluted and affect your health

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Akaltara is a located at 22.02°N 82.43°E . It has an

average height of 283 metres (928 feet). It is located in middle of Mahanadi Basin

28 km eastward distance from Bilaspur and 17 km westward distance from Janjgir. There are numbers of industries situated in this region such as Lafarge India, Arasmeta Captiv Power, KVK Bio-energy and Shyam Warehousing. The population of this place is arroung 23 thousand. Above mentioned industries and man using vehicles are the major source of air pollutant. It is very necessary to find out the gases contamination around this akaltara region

Air pollution defines as when harmful or excessive quantities of substances

including gases, particles, and biological molecules are trapped into Earth's

atmosphere . It may cause harmful diseases, allergies and even death to humans; it

may alsocause damage to other living organisms such as plants,animals and food crops, and may

harm the natural and built environment.

An air pollutant is a such as material in the air that can have bad effects on

humans and the ecosystem.

II.RESEARCH METHODOLOGY

There are many ways to measure air pollution, with both simple physical and

chemical methods and with more sophisticated electronic techniques. There are 4

main methods of measuring air pollution.

(A)Spectrophotometry

Spectrophotometry is those method which based on the absorption of radiation by gases at different
wavelengths. When a light of known intensity passes through the sample, the exiting radiations intensity spectrum can be used to determine the composition of the gas. The absorption wavelengths where intensity paly significantly drops are a footprint of every material, while the similar values of wavelength dependent extinction gives information of the concentration which following the Beer–Bougert–Lambert-law
Spectrophotometry consists of two main parts
infrared spectrophotometry at wavelengths more than700nm- 800 nm, which depend upon molecular rotation and vibration excitement; and *ultraviolet-visible spectrophotometry* in the wavelength range of 250–800 nm that is depend upon electron excitement and atomic absorption.
Infrared spectrophotometry is which used for emission measurements of most pollutant gases, like , CO_2, NO, SO_2,CO and hydrocarbons. It is also widely used for CO_2, CO measurement for ambient and indoor air quality investigation

(B)UV fluorescence

UV fluorescence is almost similar to UV spectrophotometry in a way that ultraviolet radiation is releasing into the sample; however, instead of investigating the whole intensity of absorption spectrum at the wavelength of the components fluorescence is measured. In order to prevent interaction with the exciting radiation, measurement is complete process in a large angle from the radiation direction. The measured light intensity in present case is directly and give up by the investigated gas, thus it provides an exact estimation of the concentration. UV fluorescence is mostly used for Sulphur dioxide measurements, which absorbs 220 nm UV radiation and then emits fluorescent Radiation
240-420nm

(C)Chemiluminescence

Chemiluminescence is the most common step to measure the photochemical NO_2 and NO, NO_x concentrations. This method is based on the fact that during the

reaction of ozone with NO, the resulting NO_2 molecule is going excited state and releases radiation at 1150 nm wavelength

(D)Gas chromatography

Gas chromatography is a such as measurement method for most greenhouse gases like CO_2, CH_4, SF_6 and N_2O as well as for CO. A gas chromatograph has two inlets: an inert carrier flow generally nitrogen and a sample injector

IV. RESULTS AND DISCUSSION

This chapter gives the details of Ketone and aldehyde Methane production results get from various fuel which is BS III Petrol, BS II Petrol, E5+BS III Petrol, BS III Diesel,
BSII Diesel, B10+BS III Diesel, CNG and LPG) engines which based on the vehicle categories as discussed in Methodology.

Two wheelers

The above chart shows the carbonyl emitted from two wheeler vehicles driven by BS II Petrol. Formaldehyde is the significant aldehyde from BS II Petrol which amounts to 62.2% of the total carbonyl emission (14.83 µg/km). Other major Aldehydes are acetone and acetalaldehye from BS II Petrol fueled vehicle.

Three wheelers

The above chart shows the carbonyl emitted from three wheelers driven by BS II Diesel. Formaldehyde is the major aldehyde from BS II Diesel which contain amounts to 81.3% of the total carbonyl emission (16.78 µg/km). Other major aldehydes are acrolein,acetaldhyde and acetone from BS II Diesel fueled vehicle.

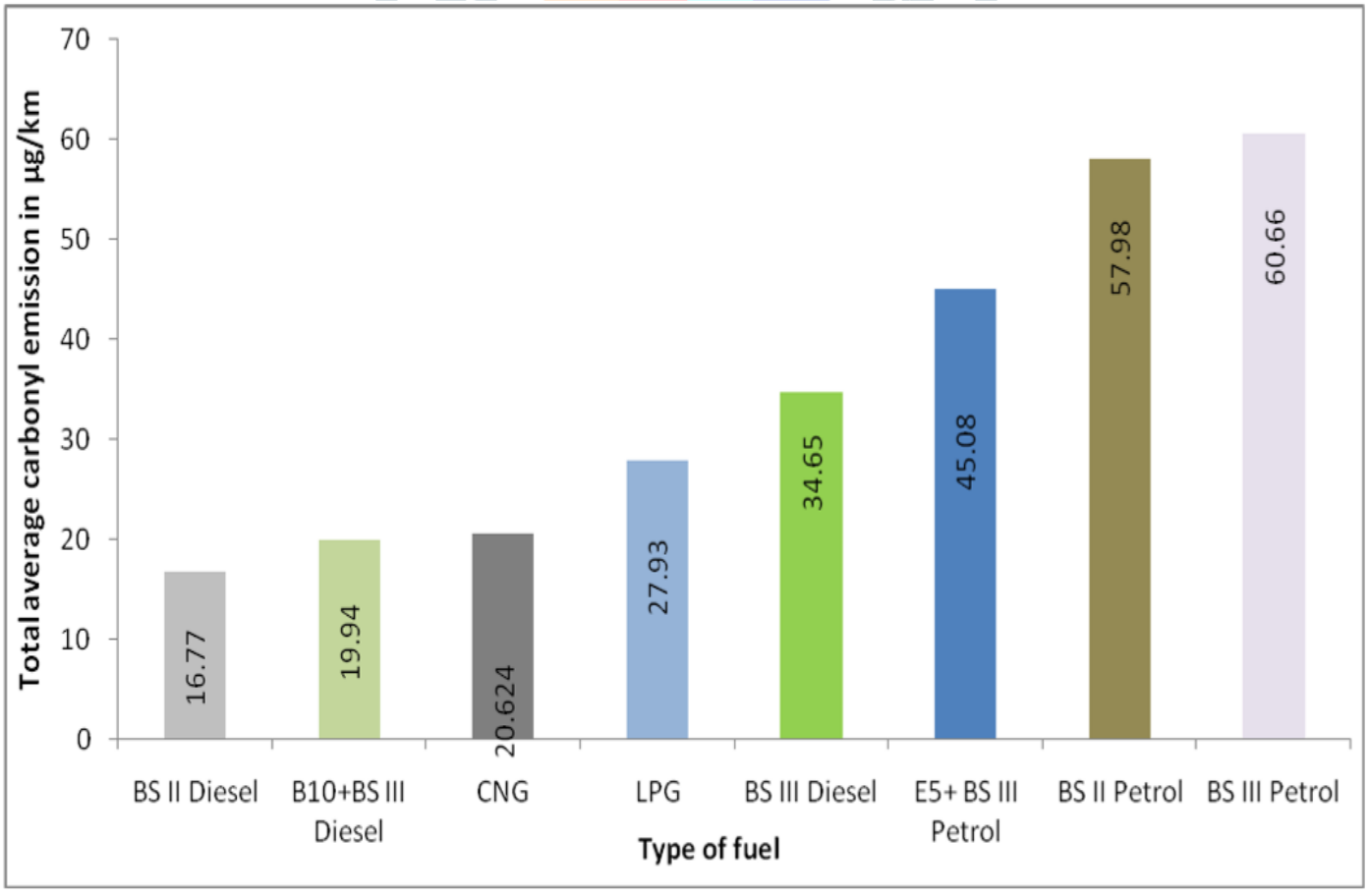
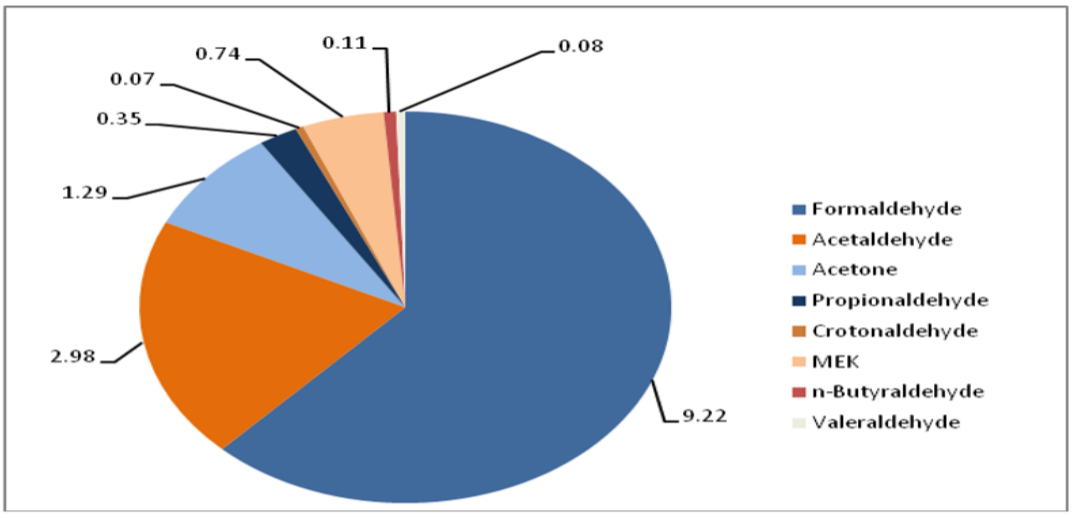


Figure: carbonyl emissions by different types of fuels

Table: Data obtained of carbonyl emitted by various types of fuels:

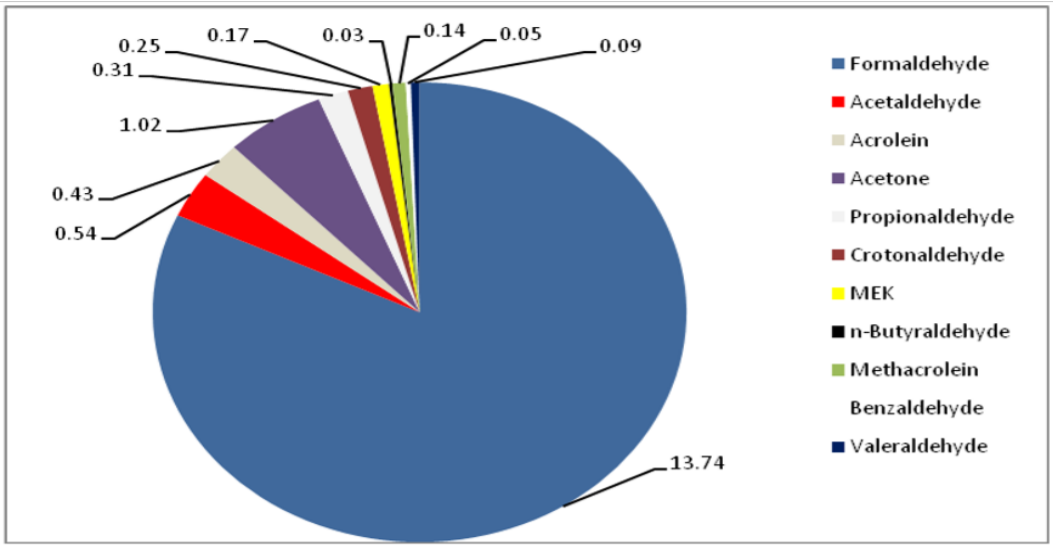
	Fuel used					
	BS II Petrol		BS III Petrol		BS III Petrol (Ref) + E5	
Name of the carbonyl compound emission	Range µg/km	Mean µg/km	Range µg/km	Mean µg/km	Range µg/km	Mean µg/km
Formaldehyde	7.88-10.09	9.22	6.31-15.61	11.21	3.61-4.79	4.01
Acetaldehyde	2.20-3.87	2.98	1.33-3.48	2.25	3.77-4.91	4.38
Acrolein	Nd	Nd	0-2.29	1.35	0-0.56	0.19
Acetone	0.63-1.67	1.29	0.92-1.73	1.23	0.18-0.81	0.58
Propionaldehyde	0.25-0.44	0.35	0.06-0.23	0.44	0-18	0.06
Crotonaldehyde	0-0.22	0.07	0-0.15	0.42	0-0.36	0.19
MEK	0.51-0.87	0.74	0-024	0.10	0.26-0.34	0.29
n-Butyraldehyde	0.08-0.14	0.11	0-0.16	0.48	Nd	Nd
Methacrolein	Nd	Nd	Nd	Nd	Nd	Nd
Benzaldehyde	Nd	Nd	Nd	Nd	Nd	Nd
Valeraldehyde	0-0.25	0.08	Nd	Nd	Nd	Nd
m-Tolualdehyde	Nd	Nd	Nd	Nd	Nd	Nd
Hexanal	Nd	Nd	Nd	Nd	Nd	Nd
Total Avg emission	14.84 µg/km		17.49 µg/km		9.72 µg/km	

Nd-Not Detectable



* MEK: Methyl Ethyl Ketone

Figure: Two wheeler vehicles gas emission chart



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