

Effect of Smell and Its Minimising Factors at Kurkumbh Industrial Area

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ABSTRACT

Rapidly growing industrialization has aggravated the problem through odorous industrial operations. Undesirable odor contributes to air quality concerns and affect human lifestyles. Odor is absolutely the most multifarious of all the air pollution problems. Controlling of odors it is required to identify the sources of odor and their type i.e. point sources and Area sources within Kurkumbh industrial area, to knowing wind speed, wind direction, temperature, humidity etc. by plotting wind rose diagram for Kurkumbh and understand that wind is blowing from north to south. In our study we define the total nine locations for measurement of intensity of odors compound that is hydrogen sulfide and ammonia. The issue of odours is very important because odorants can be an extreme nuisance and, with sufficient exposure, they can induce adverse health effects, such as nausea, vomiting, headache, loss of appetite, sleeplessness, upset stomach, and throat irritation depreciation of property values. In this paper odor pollution in the air within Kurkumbh industrial area of Daund region of Pune district is studied, including its sources and distribution, the physical and chemical properties of odor, odor emission regulations in Maharashtra. It was observed that the most feasible option to carry out an odor survey in India is to use Field Investigation Method. Applied field investigation method was modified to fit India's need to measure different odor intensities based on the Arduino uno sensor that clearly recognizable odor is observed as an annoyance. It consists of a sensor which is used to detect the presence of gases namely ammonia and hydrogen sulfide. In Kurkumbh at the time of odor survey understand that the total intensity before and after the vegetative buffer were reduced by over 30% and odorous compound concentrations for hydrogen sulfide and ammonia gas compounds were reduced by 30 to 40 % and 10 to 20 % respectively. The main advantage of our model is that the sensor does a regular act in monitoring them from their daily activities.

Keywords : Industrialization, Field Investigation, Hydrogen Sulfide, Ammonia Gas

I. INTRODUCTION

When emissions comprising odorants are free to the atmosphere they can have an impact on the environment. Although under some circumstances this could include an impact on the ecosystem or on human health that would be a factor of the chemical environment (e.g. toxicity) of the relief rather than its odorous nature. Odor, which refers to unpleasant

smells, is considered as an important environmental pollution issues.

Responsiveness to odor as an environmental annoyance has been growing as a result of increasing industrialization and the awareness of people's need for a clean environment. One of the challenges when dealing with the odor pollution problem is the technique for the detection of odor emissions. Recognition is an important part concerning agreement with the environmental guidelines, since

the detection results will be used as proof of the release of odorous substances to the environment. A successful and excellent detection technique will result in a sequence of accountably data. A reliable instrument, therefore, is necessary. There is a growing tendency in industry to develop a detection system that enables real-time measurements [4]. In this way, a simple and quick online monitoring system can be established and time-consuming methods avoided. Sampling and conventional analytical procedures are then no longer necessary, therefore the detection and measurement of the odorous compounds can be carried out quickly and the results presented on demand by using arduino uno based sensory system. Kurkumbh is located in Daund Taluka of Pune District at latitude 18° 24' 25.55" N and Longitude: of 74° 30' 16.08" E on Pune Sholapur National High Way No. 9. It is 75 Kms away from Pune and 10 kms. Away from Daund Railway Junction. Elevation above MSL. 2092 Ft. above Mean Sea Level. The nearest airport for this location is at Pune [10]. Kurkumbh industrial area is selected for the execution of research work. Kurkumbh Environment Protection C6-Op. Society Ltd. And Regional Officer -Pune MPCB is responsible authority for Prediction of impacts is an in environmental impact assessment process. There are many chemical and pharmaceutical industries in the study area. Odour pollution has definitely different characteristics and is unquestionably the most complex of all the air pollution problems. The duration of odour impact depends on the variation in time of odorous emissions from the source. In addition, climatic conditions can be a strong impact on the duration of odour impact. Stable meteorological conditions, which can be more common overnight, can lead to events of longer duration. Sensitisation is where perceived intensity increases with repeated or continuous exposure. A person's feeling to odour can depend on the location of the acceptance environment. The land-use in India is complicated, as residential areas develop close to industrial regions the impacts from odorous substances generated from industrial activities. (e.g.

pulp paper, distillery, sugar, bulk drug, pharmaceuticals, chemical and pesticides) result in increasing public complaints. Odor, which refers to unpleasant smells, is considered as an important environmental pollution issue. [3] the problem of odours is very important because odorants can be dangerous annoyance and, with sufficient exposure, they can induce.

II. MATERIAL

It consist two sensor sensed gases can be transmitted to a particular place for regular monitoring of them. This makes their work rather easier for them. The sensed gases can be transformed into signals so that a wireless communication can be established between the monitoring places where problem of odour. Hence a proper reading can be provided to them and their surroundings. Also their health conditions can be maintained in a better way which will increase their immune system. The main backbone of our proposed model is the odour sensor it consist two sensor i.e. ammonia (CH₃) MQ136 and hydrogen sulfide (H₂S) MQ135 sensor, display, 12 volt power supply etc. MQ136 gas sensor has high sensitivity to Hydrogen sulfide, Low sensitivity for other combustible gas.



It is with low cost and suitable for different application. It has good sensitivity to H₂S gas in wide

range, and has advantages such as long lifespan, low cost and simple drive circuit & etc.

III. METHODOLOGY

1) Primary and Secondary Data Collection :-

- In this case first of all, instrument are collect doen
- It consist of two sensors ,having ability to sense the gas or odour and get transmitted to a particular place for monitoring them.
- The sense gas will be transformed into signals. So that a wireless communication can be established between the monitoring place and place where problem of odour occurs.
- The main backbone of our proposed model is the odour sensor it consist two sensor i.e. ammonia (CH₃) MQ136 and hydrogen sulfide (H₂S) MQ135 sensor, display, 12 volt power supply etc.
- H₂S gas in wide range, and has advantages such as long lifespan, low cost and simple drive circuit & etc.



2.Odour Producing Sources :-

- Fertilizer Manufacture :-
Mineral fertilizers are indispensable for the intensification of plant production in agriculture. This process can cause a significant odour nuisance for the environment due to organic compounds content in apatites and phosphorites converted into fertilizer. The following chemicals compound are emitted to the gas, such as Hydrogen sulphide, organic sulphides, (methyl, ethyl, isopropyl, butyl) disulphides, chain hydrocarbons, carboxylic acid etc.

- Pharmaceutical Plants :-

During the production of various pharmaceutical products like Drugs, medicines, antibiotics etc, there is large amount of carbon monoxide, hydrocarbon compounds and chemicals are exhaust in air and leads to create odour .

- Petroleum Refining :-

The production , transportation and marketing division of the petroleum industry generally have minor odour pollution.

The odour generate during the refining contains, oxides of sulphur, hydrocarbon, oxide of nitrogen, mercaptans, hydrogen sulphide, phenolic compound, Naphthalic acid, Aldehydes, nitrogen bases, carbon monoxide. Which harmful to human health and take part in odour

- Chemical Manufacturing :-

During the production of various chemical products. The following chemicals compound are emitted to the gas, such as Hydrogen sulphide, organic sulphides, (methyl, ethyl, isopropyl, butyl) disulphides, chain hydrocarbons, carboxylic acid etc.

- Textile and Paper Industries :-

The smelly chemicals are reduced sulphides, ammonia and other organic compounds. Odour can come from sulfite pulp mills, waste water plants and landfills. These are three sources of odour in paper and textile industry.

3) Methods For Controlling Industrial Odours :-

- Provide Green Belt :-

In our study use odor controlling method as Green belt / tree buffer development. There is already green belt between Kurkumbh industrial area and Lingali. Observation of hydrogen sulfide gas and ammonia gas are taken on both side of the green belt. We got result on both side and understand that intensity of odor reduces on opposite side of treebelt. Greenbelts are used to form a surface capable of sorbing and forming sinks for odorous gases. Leaves with their vast area in a tree crown, sorbs pollutants on their surface, thus effectively reduce the concentrations in the ambient air and source emissions.

- Absorption Process

Where odorous vapors are soluble or emulsifiable in a liquid, with or without chemical reaction, absorption methods may be suitable for odor control.

Absorption is a word not without its confusing implications. It applies to a more or less uniform penetration of the absorbent by gas molecules and is not a concept 'restricted to liquid absorbents. In this discussion however, we will limit the discussion of absorption to the conventional process using liquid absorbents.

Interface (around the outside of the droplets). For example, ammonia, highly soluble in water, is readily absorbed by spraying water through a chamber containing ammonia gas.

- Adsorption

Adsorption is the phenomena of surface attractions universal with all substances. In theory it is agreed that adsorbed molecules do not penetrate the atomic or molecular construction of the adsorbent.

In adsorption there is interaction between the solid and gas. The bond may be broken by moderate elevation of temperature to drive off the chemically unaltered adsorbate. This is physical adsorption rather than chemical adsorption (this discussion does not include capillary attraction).

Control of atmospheric odors by adsorption methods is for all practical purposes limited to the use of activated carbon as adsorbent. Metallic oxide, siliceous and active earth type adsorbents are electrically polar and have strong attraction for water, which is highly polar. Polar Engineering



4.OBJECTIVES

- To identify the Odour from different sources.
- To prepare odour profile for study area.
- Measurement of odour compound and their impacts
- Measurement of concentration of various gas in air at different temperature, humidity and air speed.
- To establish the innovative remedial activities of odour reducing techniques

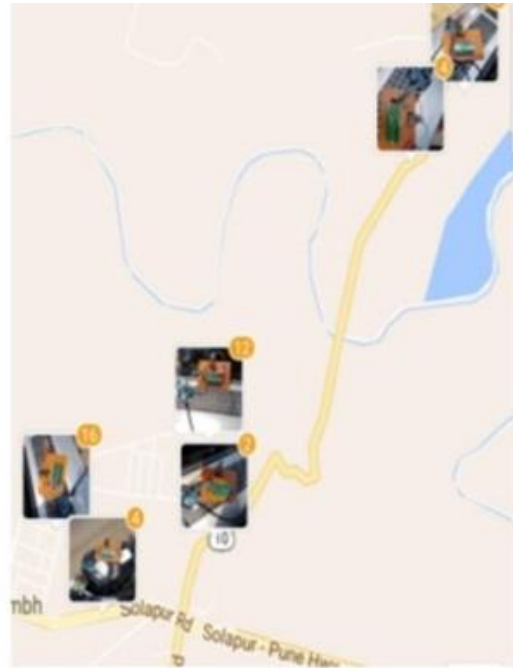
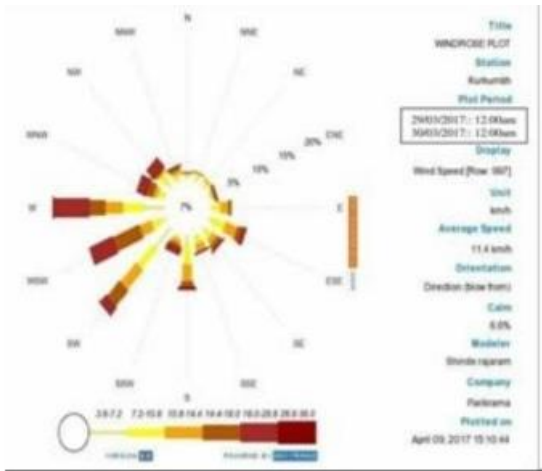
IV. SCOPE OF PROJECT

- Due to fast development of the Urbanization and Industrialization, there will be increase in Air pollution takes place. Unpleasant smell are produced in large amount. i.e. Odour
- This odour or unpleasant smell are detected by KURKUMBH industries near the DAUND region and find out the odour the odour producing gases.
- The main scope of this project is to analyze the properties of odour and also find out the odour reducing techniques which is produced from various industries like Pharmaceutical company, Sugar industries, Paper industries etc.
- It will help to produce the healthy Environment as well as to control the Air pollution

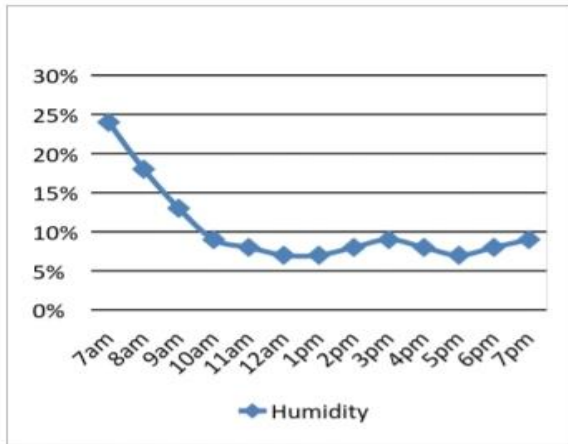
V. RESULT AND DISCUSSION

Accurate measurement of odorous compounds and their impact have been challenging because these compounds possess widely varying physical and chemical properties and are present at concentrations ranging from high parts-per-million (ppm) to low parts-per-billion (ppb). Furthermore, each odorant has a unique odour and odour detection threshold which means that compounds, even if present at the same concentration, may have markedly different odour impacts. The concentration of hydrogen sulfide (H₂S) and ammonia (NH₃) gas in the air at different temperature, humidity and wind speed are

measured when the temperature increases Intensity of that gasses decreases. variation of temperature

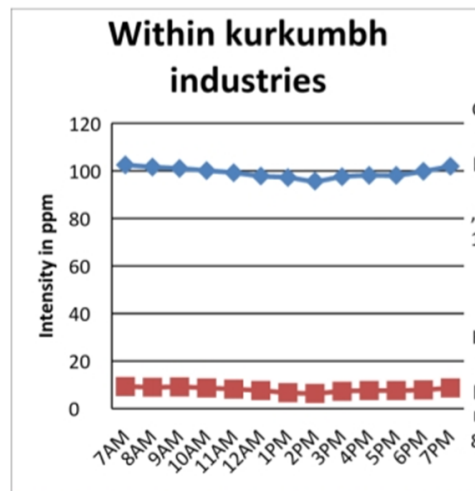
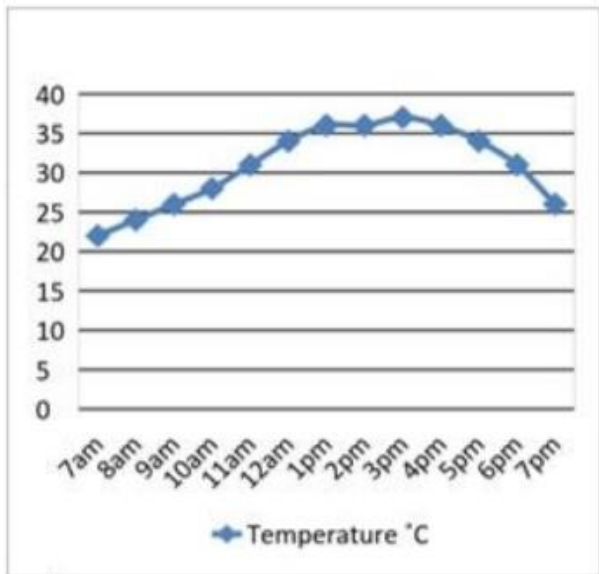


LOCATION: Within kurkumbh industries



Location of reading taken

remark	H2S in ppm	remark	CH3 in ppm	Time
Prolonged exposure may cause nausea, tearing of the eyes	9.3	throat and mucous membranes. Mild eye, and throat irritation	102.5	7am
	9.0		101.6	8am
	9.0		101.0	9am
	8.7		100.1	10am
	8.2		99.2	11am
	7.6		97.8	12am
	6.7		97.2	1pm
	6.4		95.7	2pm
	7.3		97.5	3pm
	7.6		98.1	4pm
	7.6		98.1	5pm
	7.9		99.8	6pm
	8.7		101.9	7pm

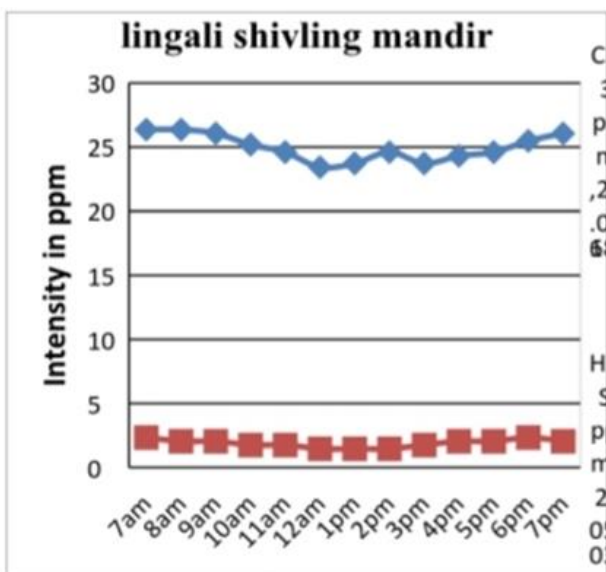


LOCATION: lingali shivling mandir behind the green belt

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remark	H2S in ppm	remark	CH3 in ppm	Time
tearing of the eyes, headaches or loss of sleep	2.34	Detectable by smell Maximum Permissible Exposure Limit	26.3	7am
	2.05		26.3	8am
	2.05		26.0	9am
	1.75		25.1	10am
	1.75		24.6	11am
	1.46		23.4	12am
	1.46		23.7	1pm
	1.46		24.6	2pm
	1.75		23.7	3pm
	2.05		24.3	4pm
	2.05		24.6	5pm
	2.34		25.4	6pm
	2.05		26.0	7pm



VI. CONCLUSION

In this paper intensity of odour producing gasses i.e. hydrogen sulfide (H2S) and ammonia (NH3) gas are measured within kurkumbh industrial area of daund region district pune . At different location different temperature, wind speed, and humidity. Then understand that the intensity of odor decreases if the temperature increases and the opposite of wind blowing and wise versa. We can decrease the odour intensity by planting the green belt around the odour producing area intensity of odour are permissible limit one side of the trees belt and other side the industries these gasses are not in permissible limit.

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