

**Atmosphere:** It is a transparent gaseous envelope around the earth. It has several concentric layers differing in density and composition of gases and properties. The density is highest near the earth's surface and decreases with the increase in altitude. The main layers of the atmosphere from the earth's surface are Troposphere, Stratosphere, mesosphere, and thermosphere. Much of the atmospheric air is found in troposphere. The atmosphere extends up to a height of 40 kms, however, there is a sufficient movement of air upto a height of 1000km, which maintains a homogeneous mixture of gases. Atmosphere makes an essential part of the life supporting system since it supplies oxygen, carbon dioxide and nitrogen. It also protects the living organisms of the earth from harmful radiation like ultra violet radiation with the help of its ozone layer present in the upper stratosphere at a distance of 26 to 16 kms infact it is thickest at a height of 26 kms. A human being breathes 22,000 times a day taking 16 kg of air infact one cannot survive without air (oxygen) more than 5 minutes.

**Air and its composition:** Air is composed of several gases which may conveniently be divided into groups as under:

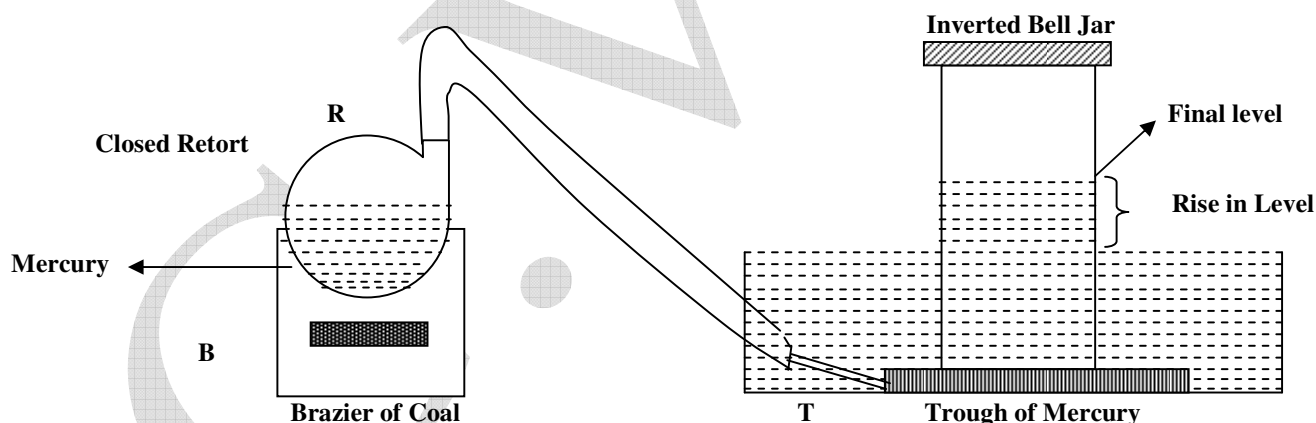
1. Constant components: These include gases like nitrogen, oxygen and noble gases the proportions of which vary but slightly CO<sub>2</sub>, water vapour and dust particles, dissolved salts are also included in the constant compounds although their properties vary in different locations at different times.
2. Accidental components: gases like SO<sub>2</sub>, H<sub>2</sub>S, NH<sub>3</sub>, CO and oxides of nitrogen which are present only in traces and are characteristic of a particular locality are called accidental components.

Composition of various gases in air is given as under:

- a) Nitrogen; 75.51%, essential for plant growth directly and animal life indirectly.
- b) Oxygen; 23.15%, supports life and combustion, helps in oxidation.
- c) Carbon dioxide; 0.033%, used as plant food.
- d) Noble gases and water vapours; 1.30%, supplies moisture for growth of living objects.
- e) Dust particles and other gases (particulate matter); 2%, causes rain, colored sun set.

**Lavoisiers Experiment to determine the composition of Air:** In 1775, a French scientist Lavoisier performed an Experiment to show that air comprises of a mixture of several gases. The experiment is described as under.

To start with, Lavoisier took some mercury in a closed retort "R" and heated it on a Brazier of coal "B". The closed retort "R" was provided with a long and curved neck, which was inserted under a bell jar "J" kept in a trough of mercury [T] as shown under.



Lavosier found that on heating the retort a red coloured powder is formed on its surface. At the same time the mercury level in the bell jar started rising. This process continued for 12 days after which the formation of the red powder (Mercuric Oxide) in the retort stopped. At this stage the total rise of mercury in the bell jar was found to about one fifth of the total volume of the bell jar.

Lavosier measured the volume of the gas left in the bell jar and found to about  $\frac{4}{5}$ <sup>th</sup> (80%) of the total volume of the jar. To rest it, he introduced a lighted candle into it, and extinguished off showing that the gas was non-supporter of combustion. Moreover, when a rat was placed in the jar, it died. This led to conclusion that the gas was unsuitable for life. Lavosier named it as "Azorta" (meaning unsuitable for life) and is now known as nitrogen.

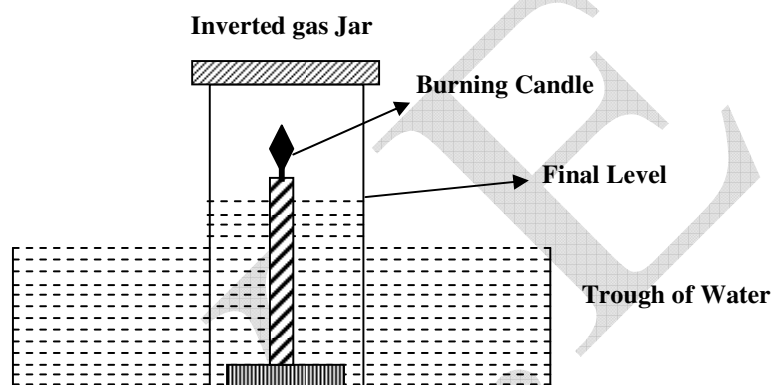
He also collected all the red powder from the closed retort and heated it strongly. It readily decomposed into metal mercury and a gas which was exactly equal in volume to the air disappeared from the bell jar. To test the gas, a burning splinter was introduced in it contained glowing the gas was a supporter of combustion and he called it oxygen.

Finally Lavoisier mixed the two gases oxygen (20%) and nitrogen (80%) and air was obtained. Thus, Lavoisier came to conclusion that air is a mixture consisting mainly of nitrogen and oxygen.

**Experiment to prove Air is a mixture of gases:** The experiment to prove that air is a mixture of gases is explained as under.

Take an empty trough and fix a candle at its centre. Fill half of the trough with water and place an inverted gas jar over the candle. Now divide the portion of gas air above the surface of water into five equal parts by pasting a long strip of paper on the gas jar marked 0, 1, 2, 3, 4, 5, starting 0 mark from the water surface.

To start with, remove the gas jar, light the candle and cover it again. After some time the lighted candle will extinguish off due to the absence of  $O_2$  in the jar. At this stage, the level of water risen in the gas jar is found to be  $1/5^{\text{th}}$  in volume of the air initially present in the gas jar. Since this volume is exactly equal to volume of  $O_2$  used by the candle, so we conclude  $1/5^{\text{th}}$  of the air is oxygen i.e. about 20% is Oxygen.



Now keeping its closed with a lid places the gas jar right side up. A burning splinter is put in this jar to test the gas left behind. It is observed that the splinter gets extinguished off, showing that the gas in the jar is non-supporter of combustion. Since nitrogen is non-supporter of combustion. So the gas left i.e.,  $4/5^{\text{th}}$  of air is nitrogen i.e., about 80%. However it also contains small amount of some other gas, which does not support combustion.

**Particulate matter in atmosphere:-** Atmosphere air contains minute solid particles or liquids droplets suspended in it, these are called as particulates. These particulates of varying size, physical state and also arise from various sources. Some of the commonly found of air (atmosphere) is pollen grains, bacteria, fungi, viruses, spores sand, fur hair, pesticides, insecticides, dust etc.

**Kinds of particulate matter of atmosphere:-** Some of commonly found and important particulate of atmosphere are:-

- 1) **Aerosols:-** These comprises of extremely small solid or liquids particles suspended in the air. These particles have diameter less than one micrometer ( $10^{-6}\text{m}$ ) and behave like the atmosphere gases. The aerosols remain suspended in air indefinitely and move with air currents.
- 2) **Dust:-** These consists extremely minute solids particles having diameter more than one micrometer ( $10^{-6}\text{m}$ ) suspended in the air. These particles do not disperse in air for a long time as these settle down due to the force of gravity.
- 3) **Droplets:-** These contain small particles of water any other liquid, which remain suspended in the air as long as air is in turbulent condition. These fall down when the air becomes still.
- 4) **Fly ashes:-** These comprise of the small ash particles carried into the air by the gases produced during the combustion of various fossils fuels, for example coal ash, charcoal ash etc.
- 5) **Fog:-** the extremely small particles of water suspended in the air near the surface of the earth. It occurs during the winter season and it produced due to condensation of water vapour present in the air.
- 6) **Mists:-** These consists of extremely small liquid particles having diameter more than one micrometer ( $10^{-6}\text{m}$ ).

- 7) **Fumes:-** These consists of minute solid particles, which are formed by the condensation of vapours, distillation sublimation and in various chemical process.

**Effects of particulate matter or pollutants:-** The various particulate matter or pollutants present in the air effect our health, vegetation, livestock and belongings in different ways. However a few important of them are:-

1. Pollen grains, fungal, bacterial and viral spore suspended in air causes various allergic reactions in the human body.
2. These are also responsible for various diseases and disorders of the human body like asthma, bronchitis and tuberculosis.
3. These are less transparent and reduce visibility by producing haze in the atmosphere, which sometimes cause severe accidents on roads and rails.
4. Smoke, acid rain and photochemical smog affects metals and buildings by blackening their outer surface.
5. These reduce the amount of insulation (incoming solar radiation) reaching on to the surface of the earth and thus disrupt its heat balance.

**Carbon-dioxide and its effects on living organisms:-** The carbon is a basic constituent of all organic compounds found in the protoplasm, such as carbohydrates, proteins, fats and nucleic acids. The basic source of carbon for the living organism is atmospheric carbon dioxide. It is produced during volcanic activities. Respiratory activity of plants and animals, decay of organisms and combustion of fuels. The atmospheric carbon dioxide is mainly consumed or fixed by the phototrophs during the process of photosynthesis to produce the simple sugar like glucose. However the respiratory activity of plants and animals return back the fixed carbon dioxide into the atmosphere.

However an increase in the amount of carbon dioxide level of atmosphere may be effective for the living organisms.

**Some of these effects are:-**

1. It absorbs the infrared rays by the earth surface and thus helps in the heating of atmosphere. However an increase in the CO<sub>2</sub> level of the atmosphere would increase the average temperature of the earth, which in turn would cause polar ice caps and glaciers to melt and produce enormous amount of water. This would cause rise in the sea level by about 100 meters leading in great destruction all around.
2. An increase in the CO<sub>2</sub> level of the atmosphere would increase the pollution level of the atmosphere because CO<sub>2</sub> is a pollutant gas. Causing damage to both living organisms and vegetation.

**Role of plants:-** Plants play an important role in maintaining our environment. Some of these include:-

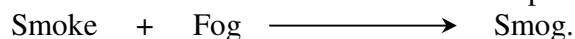
1. Plants maintain a balance between the carbon dioxide and oxygen level of the atmosphere. Through the process of photosynthesis and respiration.
2. Plants replenish the CO<sub>2</sub> and oxygen gases of our atmosphere.
3. Plants reduce the air pollution caused due to the presence of excessive amount of CO<sub>2</sub> in the air.
4. Plants regulate the temperature of the atmosphere by evaporating surplus water into the atmosphere.
5. Plants provide us timber and fuel wood.
6. Plants act as wind barriers and reduce speed of the wind.
7. Plants control the noise level of the atmosphere.
8. Plants and trees check heat radiation and thus protect us from the glare of the bright sunlight.

**Carbon Monoxide and its harmful effects:-** Carbon monoxide is a highly toxic gas. It is colorless odorless and is produced mainly due to the incomplete combustion of fossils fuels like coal, petroleum etc. its inhalation causes various serious disease and disorders in the body. However, carbon monoxide mainly reduces affinity of the hemoglobin of the blood towards oxygen and cause headache. Dizziness, choking, cardiac and pulmonary complications or even death of an organism. In act, when carbon monoxide is inhaled, it readily combines with the haemoglobin of our blood and form a stable compound called (CoHb).This compound makes our blood incapable of carrying oxygen and thus causes oxygen deficiency, which may result in many serious diseases and disorders.

**Effects of increasing amount of O<sub>2</sub> :** oxygen gas is essential for various processes like metabolism, respiration combustion and corrosion etc. now if the amount of oxygen is increased in the air, all these processes will speed up resulting to various harmful life hazards. For instance increase in the rate of metabolism in the bodies of

human beings and other animals would also increase and many cause several damages to their health. Similarly increase in the rate of combustion will accelerate the rate of combustion of the fuels of which all the fuels will burn rapidly and dangerously. Likewise in the presence of more oxygen the fruits and vegetables will get spoiled more quickly and the colours of the clothes will fade more rapidly.

**Smog:-** Smog is a combination of smoke particles with the minute droplets of fog, containing various poisonous gases evolved in the combustion of fossil fuels like coal petroleum etc.



Smog contains poisonous gases like sulphur dioxide, nitrogen dioxide and peroxy acyl nitrate (PAN). It envelops the entire areas like a blanket and reduces visibility. It harms animals, plants and trees. The harmful particles of the smog block the stomatal openings of plant and tree leaves rendering them to wilt. Sometimes they are harmful to the extent that they kill the entire vegetation of an area.

The harmful effects of smog can best be illustrated by the famous London smog of 1952 resulting in the death of 4000 people and many suffered heart problems and bronchitis. Smog has caused eyes and throat irritation, reduced solar radiation and plant foliage damage in Tokyo and Los Angeles.

**Harmful effects of Smog:-** The various harmful effects of the smog are listed as under:-

1. In effects our health and causes many fatal diseases like bronchitis, respiratory tract inflammation, asthma and various cardiac disease.
2. It causes irritation and allergic reaction in eyes, noses and throat etc.
3. it damages our vegetation seriously and causes severe economic loss to us.
4. It reduces visibility in air and often results in severe accident on roads and rails.
5. Photochemical smog bleaches and blazes foliage of economically important plants and crops.
6. It blocks the stomatal openings of the plants and trees and renders them to wilt.

**Metallic particles of atmosphere:-** The atmospheric air contains a varied of metallic particles which are highly toxic to all the living organisms, livestock and vegetation. These are mainly released into the environment through industries and factories. However a considerable amount of metallic particles are also released into the atmosphere by agricultural particles and transport vehicles like cars and buses. The main metallic particles present in our atmosphere are lead mercury, cadmium, arsenic, zinc, chromium, nickel, iron, tin and aluminium etc. all these particles are extremely harmful for the health of organisms, however the metallic particles of mercury and lead are most harmful to us.

**Metal lead and its harmful effects:-** Lead is highly toxic metal. Its particles are released in to the atmosphere from the various motor vehicles, industries engaged in the mining extraction and purification of metal lead, and industries engaged in the manufacturing of lead alloys and paints. Lead particles affect our health and cause various diseases and disorders, some of its harmful effects are:-

1. It causes damage to various vital body organs like liver, kidneys etc.
2. It disrupts the functioning of our body cells and tissues by inactivating various enzymes.
3. It interferes with the development and maturation of RBC's and cause anemia.
4. It induces abnormalities in fertility and pregnancy.
5. It also causes coagulation of the body proteins.

**Harmful effects of mercury particles:-** The mercury metal and its compounds are highly toxic. Mercury is quite volatile and can easily be absorbed through the skin. The main sources of mercury as pollutant are:-

1. Dumping of mercury containing industrial wastes into the environment and in water bodies.
2. During mining and metallurgical operation of mercury ores.
3. Use of some fungicides, which contain mercury and its salts.

Mercury is a health hazard. The excessive accumulation of mercury in the body results in a disease called mercury poisoning. Mercury poisoning causes a disease called Minamata in human beings. This disease weakens the muscles and results in weakness in hearing and vision capacity. Anemia, mental retardation and paralysis.

**Harmful effects of asbestos:-** It is a fibrous mineral made of silica and metallic element sheets arranged alternately. It is obtained from digging open pits in metamorphic rocks. Asbestos dust is a serious air pollutant. Persons involving in mining of asbestos may inhale these fibers. Prolonged of asbestos dust by human beings causes a disease known as asbestosis. It is a lung disease and causes respiratory problems. It also causes shortness of breath and swollen fingers and toes.

**Pollution:-** Pollution is an undesirable change in the physical, chemical or biological characteristics of our air, land and water that will harmful affects the human life and the desirable species, or that may waste nor deteriorate our raw material resources.

The problem of environmental pollution is increasing day by day, the heavy population explosion together with rapid industrialization for the betterment of living standards and the subsequent urbanization have led to the large scale contamination of natural resources.

Pollution is caused by agents called pollutants, pollution is of various types as Air pollution , soil pollution, radioactive pollution and water pollution.

**Air Pollution:-[south wick 1976]:** It may by defined as, an undesirable alteration in the physical, chemical or biological characteristics of air largely as a result of human activities, and the substances which pollute the air or which causes pollution of the air are called as pollutants or air pollution. Air pollution is mainly caused due to two processes.

**1. Natural Processes:-** Some of the natural processes which causes air pollution are:-

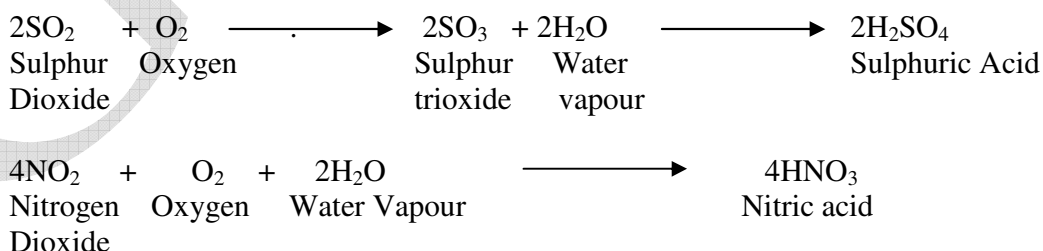
1. The gases and particulate matter released along with lava from volcanic eruptions.
2. The dust raised ground during the storm and strong winds.
3. Smoke from forest fires.
4. Methane gas produced by marshy areas.
5. The decomposition of plant and animal remains.
6. Pollen grains
7. Evaporation of volatile organic compounds from leaves.

**2. Artificial processes:-** Various artificial processes or activities of man also cause air pollution. These are man made sources of air pollution. Some of the human activities, which cause air pollution, are:-

1. Smoke obtained by burning of fuels (Coal , Oil , Gasoline etc) in power, industrial plants and in motor vehicles. This is the prime cause of air pollution.
2. Many industrial wastes
3. Many harmful gases obtained from industrial processes such as chlorine, oxides of nitrogen, ammonia, oxides of sulphur , benzene vapours , chlorofluorocarbons. (CFCs).

**Effects of air pollution:-** Air pollution has many bad effects on the living world. Presence of gases in the air is irritating to the eyes and respiratory system. Smoke also causes blackening of buildings and damages plants. Polluted air can harm even strong material like concrete and steel. Air pollution also affects the weather of particular place by changing the average temperature; particulates present in air scatter the sun rays and do not allow them all to reach the ground. This brings about a drop in the temperature of the atmosphere of that area. Presence of carbon dioxide and other gases like methane do not allow the sunlight to reach the ground but, they tried suns heat near the ground and do not let escape into space. This makes the average temperature of that are to rise.

**Acidic gases of atmosphere:-** Atmospheric air contains various gases which are more soluble in a particular liquid than air. These pollutants gases when combine with water from acids and are accordingly called as acidic gases. The main acidic gases of atmosphere are sulphur dioxide and nitrogen dioxide. The sulphur dioxide gas of the atmosphere with the oxygen and water vapour of the air to form nitric acid as shown under.

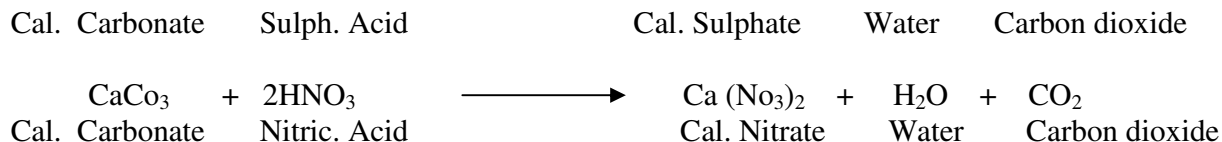


These acid dissolve in rainwater in the upper atmosphere and fall down on to the earth surface as acid rain.

**Effects of acidic gases:-** Two main effects of acidic gases are:-

1. Acidic gases cause decolourisation and damage of the historical monuments especially those made up of marble stone (calcium carbonate). The chemical reaction of acidic gases and calcium carbonate can be shown as under:





2. Acidic gases cause corrosion of metals, which is a slow destruction of metals as a result of chemical reaction between air, moisture, and atmosphere pollutants.

**Radio active pollution:-** The pollution caused to the emission of various types of radioactive rays by the radioactive substances is called radioactive pollution. These rays are highly dangerous and harmful for all the living organisms and even pollute all the major life supporting system like soil, water and air etc. though the biotic community including man has been exposed to low levels of radiation from natural sources for several million years.

**Sources of radioactive pollution:-** Radioactive pollution is caused mainly due to two sources viz.

**1. Natural sources:-** The natural sources of radioactive pollution are mainly the naturally occurring radioactive substance like uranium, radium, polonium, thorium, and carbon 14 etc. all these substances emit out highly dangerous and harmful radiation like alpha, beta and gamma rays.

**2. Artificial sources:-** The various artificial sources of the radioactive pollution are industries engaged in mining and refining of radioactive substances, nuclear wastes, nuclear weapons, preparation of radioisotopes and treatment of cancer by gamma rays.

**Harmful effects of radioactive pollution:-** The various serious effect of radioactive pollution include:

1. It causes irreparable damage of the cells and tissue of body.
2. Its frequent and prolonged exposure causes several serious like leukemia and cancer etc.
3. It may induce mutation in the chromosomes of an organism and cause various genetic disorders.
4. It causes contamination of milk and its products, which may prove harmful to the health of an organism.
5. It causes severe damage to plants and trees and can reduce the yield of a crop.
6. Higher doses of nuclear pollution can cause instantaneous death of an organism.

**Noise pollution:-** Noise may be defined as sound without value or any sound that is undesirable for a recipient. Noise pollution thus refers to the unwanted sound dumped into the atmosphere leading to health hazards. It however is a physical form of pollution and has no persistent effects on the life supporting system but it has direct effects on a recipient.

**Sources of noise pollution:-** Noise is either natural such as thunder or man – made. The main sources of man made noise is developed urban areas are automobiles such as motors, trucks, buses etc. factories, industries, trains air planes. And accessory noise producers such as horns. Sirens, musical instruments, television radio , dogs, shouting loudspeakers etc. some of the important sources of noise pollution are:-

**1. In homes:-** The sources of noise pollution in homes are generally loudly played music system like radios, stereos, television, and loud speakers, in addition modern household gadgets like mixer, grinder, vacuum cleaner, washing machines, coolers etc. Produce unbearable sound and are therefore, sources of noise pollution.

**2. In Transport:-** The engines and horns of vehicles like scooters, cars, motor cycles , trucks , buses , trains produce a lot of noise pollution.

**3. In Industries:-** Almost all the industries cause noise pollution. These factories use various types of small and big machines, which make loud and irritating noises. For example printing presses, textiles factories, electricity generating plants, steel – fabricating plants, etc. all produce a lot of noise pollution.

**Measurement of noise:** The intensity of sound of noise measured in the units called as decibels which is denoted as dB. The human ear is sensitive to sounds having intensity from zero dB to 180 dB i.e., it can hear sounds having intensities from zero to 180 dB. Modern conversation has a noise value of about 60 dB. Any value greater than 80 dB causes noise pollution. Noise becomes undesirable at 140 dB. If a man is subjected for long periods continuously with 85 dB sound, his hearing ability is affected.

**Effects of noise pollution:-** The various effects of noise pollution in human beings are summarized as under:-

**1. Auditory effects:-** The most active and immediate effect of noise pollution is impairing of hearing leading to auditory fatigue and may finally result in complete deafness of the recipient.

**2. Non auditory effects:-** These effects are very dangerous as they may cause severe diseases and can be briefly described as under:-

1. It interferes with speech communication.
2. It leads to ill temper, bickering, mental disorientation and behaviour.
3. It causes loss of working efficiency due to physiological disorders.
4. It leads to neurosis, anxiety, hypertension, nausea and headache, fatigue, visual disturbance and cardio – vascular diseases etc.
5. Recent research on the effect of jet noise has shown alarmingly that fabricating silencing devices and their use in aircraft engines, trucks, car, scooters and industrial machines, there is much higher incidence of psychiatric illness and also a danger to health of the pregnant mothers and small infants.
6. Noise can temporarily diminish sexual feelings.

**Control of Noise pollution:-** The different methods employed to control noise pollution are as under:-

1. Control of noise pollution at source may be achieved by designing, and fabricating silencing devices and their use in aircraft engines, trucks, car, scooters and industrial machines.
2. Noise at source can be minimized by the proper lubrication and better management of industrial machinery.
3. Noise at source can also be insulated by the various machines in soundproof materials.
4. Noise intensity can also be minimized by installing factories and industries far away from cities of dwelling places.
5. Noise intensity can be minimized by restricting use of loudspeakers and amplifiers at fixed intensity and hours of the day.
6. Noise intensity can be minimized by stuffing of cotton ball in the ears with hands under noise conditions.
7. Planting of trees around buildings and along roadside also reduces sound intensity.

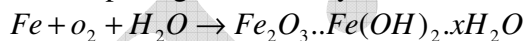
**Corrosion of metals:-** When metals are exposed to atmospheric conditions, they react with air or water in the environment to form undesirable compounds. This process is called corrosion. As a result of corrosion, these metals get eaten up on long exposure. The presence of pollutants like carbon dioxide and sulphur dioxide make the corrosion rapid. Corrosion causes destruction of metals on big buildings and monuments. Acidic gases present in the atmosphere act as abrasives and damage the statues.

**Conditions favouring corrosion:-**

1. Presence of moisture and oxygen
2. Presence of acidic gases
3. Presence of dissolved salts and other pollutants
4. Presence of another metal

**Rust:-**

Rust is the slow destruction of iron by the chemical attack of air and moisture. It appears as a brownish layer which peels off exposing the inner layer for further corrosion



Rust

**Methods to prevent rust:-**

1. Enamelling i.e. to bake metals with mixture of silicates as in case of pressure cookers, cups, refrigerators etc.
2. By painting
3. Tinning
4. Electro plating
5. Galvanization
6. Use of grease, oils etc

### TEXTUAL QUESTIONS

**Ans1.**

The various components of air include nitrogen, oxygen, carbon dioxide, argon, neon, helium, krypton, hydrogen, hexon, nitrous oxide, methane etc. it also contains moisture and dust particles.

**Ans2.**

Oxygen gas is essential for the processes like metabolism, respiration, combustion, and corrosion of metals etc. Now, if the amount of atmospheric oxygen is increased, all these processes would get enhanced resulting to harmful consequences of the living organisms. For instance, its increase would increase the metabolism rate in the bodies of humans and other animals causing severe damage to their health. Similarly the rate of combustion of the fuels would get accelerated, as a result of which the fuels would burn dangerously and rapidly. In addition the fruits and vegetables would get spoiled more quickly and the clothes fade more rapidly.

**Ans4.**

The ozone cover present in the upper atmosphere acts as a protective shield against the harmful ultra violet radiation radiated by the sun along with the cosmic rays. So in the absence of this ozone all these harmful radiation will reach on to the surface and prove lethal for the living organisms including humans. It also acts as a reflector for the infrared rays reflected by the earth surface, which help in heating its atmosphere. So in the absence of this cover all the reflected infrared rays will escape in to the outer making it difficult to live on the globe.

**Ans6.**

Nature maintains a balance between the carbon dioxide and oxygen with the help of living organisms. Atmosphere acts as a chief reservoir of the carbon dioxide, which is supplied by the volcanoes, combustion of fossil fuels, respiratory activity and decay of the living organisms. However green plants use the atmospheric carbon dioxide during photosynthesis to prepare food and in turn release oxygen in the process. These two gases get continuously exchanged with the environment to maintain their balance.

**Ans7.**

If the amount of carbon dioxide in the atmosphere would increase, it would increase the average temperature of the earth because carbon dioxide is a green house gas. On the other side increase in the amount of dust particles of the atmosphere would increase the pollution level and decrease the average temperature of the earth.

**Ans10**

The gases of atmosphere, which combines with the water vapour and result in the formation of the acids, are referred to as acidic gases. For example nitrogen dioxide and sulphur dioxide are the acidic gases. These gases mix up with the rainwater and come down as acid rain, which corrodes the buildings made up of marble stone (Calcium carbonate). This damaging effect is slow and cannot be observed in case of newly constructed buildings; however the effect becomes visible and prompt after some time.

**Fill in the blanks:**

1. The metallic element present in the exhaust of automobiles is.....
2. The percentage by volume of oxygen in air is.....
3. Greenhouse effect is due to .....
4. The metal which causes Minamata disease is .....
5. Radiations absorbed by CO<sub>2</sub> are called .....
6. Air pollutant that affects the transport of oxygen by combining with haemoglobin is. ....
7. The major constituent of air is .....
8. In the human body carbon monoxide competes with oxygen for .....
9. Corrosion of iron is called .....
10. The poisonous mixture smoke, dust and fog is called .....
11. The acid rain is due to the pollutants .....
12. The main air pollutants containing sulphur is .....
13. The ..... pollution causes cancer disease.
14. .... radiation causes skin cancer.
15. Sulphur containing gases come in air from .....
16. Van Allen radiation belt is in ..... sphere.



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GRAVE