

**Exercise :8 A****1. Define the following terms****(i) pollution (ii) pollutant (iii) air pollution.****Solution:**

- i) Presence or introduction of harmful or poisonous substance into environment is called as pollution.
- ii) Toxic or harmful substances that have adverse effect on the environment and living beings are known as pollutants.
- iii) Degradation of air quality due to increase in concentration of harmful contaminants is called as air pollution.

**2. Name any four gaseous pollutants.****Solution:**

Hydrogen sulphide, Carbon monoxide Nitrogen oxide, Sulphur dioxide.

**3. Name the compounds of sulphur that cause air pollution. Also state the harmful effects of sulphur compounds.**

**Sulphur dioxide, Hydrogen sulphide and Sulphur trioxides are the compounds of sulphur that cause air pollution.**

- Harmful effects of sulphur compounds are as follows
- Sulphur dioxide affects crop yield and causes damage to lungs. Sulphur dioxide affects crop yield and causes irritation to human eyes.
- Sulphur trioxide combines with water to form  $H_2SO_4$  which causes acid rain.

**4. State****i) natural sources of air pollution****ii) man-made sources of air pollution****Solution:**

- i) Volcanoes, decaying vegetation, forest fires and dust storms.
- ii) Automobiles, factories, industrial processes and decay of crop residue in rural areas .

**5.****a) How do oxides of nitrogen enter the atmosphere?****b) What are their harmful effects?****Solution:**

a)

Oxides of Nitrogen enters the atmosphere in the following ways

On the burning of fuels in furnaces, the temperature increases. At high temperature, nitrogen and oxygen present in the air combine to form oxides of nitrogen.

Oxides of nitrogen are produced during the burning of fuel in an internal combustion engine. They enter the atmosphere as exhaust gases.

During thunderstorms, nitric oxide is formed by the reaction between atmospheric nitrogen and oxygen in the presence of electric discharge.

Nitric oxide further reacts with atmospheric oxygen and ozone to form nitrogen dioxide.

b) Following are the harmful effects caused by the oxides of nitrogen

- Nitrogen oxides causes irritation in mucous membrane.
- Large concentrations of Nitrogen oxide causes lungs problems in humans
- It causes injuries to vegetation by damaging leaves.
- Nitrogen oxide oxidises Hydrocarbons in the presence of sunlight, which causes eye irritation, asthma attacks, nasal and throat infections.

**6. State the origin and health impact of smog.**

**Solution:**

Pollutant which is a combination of oxides of Nitrogen and Sulphur and partially of hydrocarbons produced by industries and automobiles. This forms a dark, thick soot laden fog know as smog.

Impacts of smog

- Smog is noxious and irritating
- Smog reduces visibility
- Smog causes respiratory problems
- Smog can cause suffocation and death.

**7. What are the harmful effects of oxides of Sulphur?**

**Solution:**

Below are the harmful effects of oxides of Sulphur

They cause headache, vomiting and even death due to respiratory failure.

Sulphur oxides destroy vegetation

They make buildings and constructions weak.

Sulphur oxides form smog when they combine with smoke.

Sulphur trioxide mixes with water to form sulphuric acid, which causes acid rain.

**8. State the main sources and effects of carbon monoxide.**

**Solution:**

Incomplete combustion of fuels in homes, factories and automobiles are the sources of carbon monoxide.

Below are the harmful effects caused by carbon monoxide.

- It decreases the oxygen-carrying capacity of the lungs.
- A high amount of Carbon-monoxide paralyses normal brain function.

**9. Give the mechanism of the action of carbon monoxide.**

**Solution:**

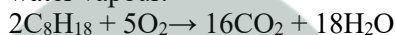
When we inhale carbon monoxide, it combines with haemoglobin which carries oxygen to tissues. Haemoglobin binds Carbon monoxide 200 times more strongly than it does with Oxygen. This reduces the Oxygen carrying capacity of the blood by converting Haemoglobin to carboxyhaemoglobin.

**10. How can we control carbon monoxide poisoning?**

**Solution:**

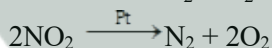
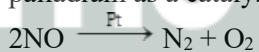
**We control carbon monoxide poisoning by taking following measures.**

- By switching over from internal combustion engines to electrically powered cars.
- Many pollution control devices are now installed in cars. Most of these devices help reduce pollution by burning gasoline completely. Complete combustion of gasoline produces only carbon dioxide and water vapour.



- By using substitute fuels for gasoline: Natural gas in both compressed (CNG) and liquefied (LNG) forms is now increasingly being used as fuel. Alcohols are other feasible substitutes.
- By using catalytic convertors:

i. Nitrogen oxide is reduced to nitrogen and oxygen in the presence of finely divided platinum or palladium as a catalyst.



ii. Carbon monoxide changes to carbon dioxide in the presence of finely divided platinum as catalyst.

