# Chemistry 10

## Chapter 14 - Environmental Chemistry 1: The Atmosphere

## Exercise - Short Questions



**1. Explain the phenomenon of decreasing temperature in troposphere.**

As the concentration of gases decreases gradually with the increase of altitude, correspondingly temperature also decreases at a rate of 6°C per kilometre.

**2. Differentiate between primary and secondary air pollutants.**

**Primary pollutants** are the waste or exhaust products driven out because of combustion of fossil fuels and organic matter. These are oxides of sulphur ($SO_2$ and $SO_3$ ); oxides of carbon ($CO_2$ and CO).

**Secondary pollutants** are produced by various reactions of primary pollutants. These are sulphuric acid, carbonic acid, nitric acid.

**3. State the major sources of CO and CO2 emission.**

i. Both of these gases are emitted due to volcanic eruption and decomposition of organic matter naturally.

**ii.** Forest fires and burning of wood also emit $CO_2$ and CO. Especially, when supply of oxygen is limited, emission of CO dominates.

**4. $CO_2$ is responsible for heating up atmosphere, how?**

$CO_2$ is responsible for heating up atmosphere $CO_2$ traps heat in the atmosphere by letting UV rays in but blocking infrared rays from getting out. And furthermore, burning fossil fuels increases $CO_2$ levels, trapping more heat.This trapped heat raises the Earth's average temperature, causing global warming.

**5. CO is a hidden enemy, explain its action.**

CO is a hidden enemy. It is colorless and odorless, making it hard to detect. When inhaled, it binds with hemoglobin more strongly than oxygen, reducing the body's oxygen supply. High levels of CO can cause headaches and fatigue. Prolonged exposure can lead to breathing difficulties and even death. This is why burning fuels in closed spaces is unsafe, and it's important to turn off heaters and stoves before sleeping.

**6. What threats are there to human health due to $SO_2$ gas as air pollutant?**

i. $SO_2$ is a colourless gas having irritating smell. It causes suffocation, irritation and severe respiratory problems to asthmatic people.

ii. $SO_2$ forms sulphuric acid which damages buildings and vegetations.

**7. Which air pollutant is produced on anaerobic decomposition of organic matter?**

During anaerobic decomposition of organic matter primary air pollutant, Methane ($CH_4$) is produced

**8. How does acid rain increase the acidity of soil?**

Acid rain increases the acidity of the soil. Many crops and plants cannot grow properly in such soil. It also increases the toxic metals in the soil that poison the vegetation. Even old trees are affected due to acidity of soil. Their growth is retarded. They get dry and die.

**9. Point out two serious effects of ozone depletion.**

i. Decreased ozone layer will increase infectious diseases like malaria.

ii. It can change the life cycle of plants disrupting the food chain.

**10.How is ozone layer formed in stratosphere?**

Ozone is an allotropic form of oxygen consisting of three oxygen atoms. It is formed in atmosphere by the association of an oxygen atom with an oxygen molecule in the mid of stratosphere.

$$O_{(g)} + O_{2(g)} \longrightarrow O_{3(g)}$$

**11.Why does 75% of the atmospheric mass lie within the troposphere?**
About 75% of the atmospheric mass is found in the troposphere because this layer is closest to the Earth's surface. Gravity pulls air molecules down, concentrating most of the mass here.

**12.How ozone layer is being depleted by chlorofluorocarbons.**
These compounds can leak and reach the stratosphere. In the stratosphere, ultraviolet (UV) radiation breaks CFCs apart, releasing reactive chlorine free radicals. These free radicals react with ozone, converting it into oxygen. One chlorine free radical can destroy many ozone molecules. The area where the ozone layer is depleted is known as the ozone hole.