

ENVIRONMENTAL CHEMISTRY

Very Short Answer Questions:

1. What is chemical oxygen demand (COD)?

Ans. The amount of oxygen required to oxidise organic substances present in polluted water is called as chemical oxygen demand. It is an important parameter for determining the quality of water.

2. What is Bio chemical oxygen demand (BOD)? Give the possible BOD values of clean water and the polluted water?

Ans. The amount of oxygen used by the suitable micro-organisms present in water during five days at 20° C is called biochemical oxygen demand. For pure water, BOD is about 1 ppm and for polluted water is about 100 - 4000 ppm

3. Which oxides cause acid rain? And what is its pH value? (Mar - 2013)

Ans. Sulphur dioxide and nitrogen dioxide after oxidation and reaction with water forms acid rain.

The pH of rain water is 5.6



4. Name two adverse effects caused by acid rains? (MAR-13)

Ans. The adverse effects caused by acid rain are

- (i) Acid rain washes away nutrients needed for their growth.
- (ii) Acid rain causes respiratory ailments in human beings and animals.
- (iii) It corrodes water pipes resulting in leaching of heavy metals like iron.

5). **what are pollutant, contaminant, and speciation?**

A) **Pollutant:** The substance which is present in nature and causes the pollution is called as pollutant.

Contaminant: The substance which does not occur in nature but releases into the environment due to human activity and causes the pollution is known as contaminant.

Ex: in the Bhopal gas tragedy, contaminant is MIC i.e. methyl isocyanate

Speciation: The detection of different chemical forms of inorganic, organic compounds present in the Environment causing pollution is known as speciation.

6. **Green house effect caused by__& __?**

Ans. Green house effect is caused by CO_2 , ozone and chlorofluoro carbon gases

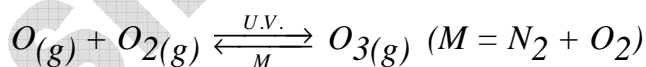
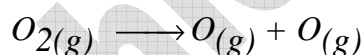
7. **Name the common components of photochemical smog?**

Ans. The common components of photochemical smog are ozone, nitric oxide, acrolein, formaldehyde and peroxyacetyl nitrate. (PAN).

It causes serious health problems. Both ozone and PAN act as powerful eye irritants.

8. **How is ozone formed in the stratosphere?**

A) Oxygen from troposphere reaches to stratosphere and converts into ozone by absorbing uv light.



9. **In which segment of atmosphere ozone is present, what is the advantage of ozone layer?**

Ans. Ozone is present in stratosphere. It protects us from UV. Radiations which causes skin damages.

10. **Define receptor and sink? (MAR-2013)**

Ans. Receptors: The medium which is affected by a pollutant is called Receptor.

E.g.: eye irritation caused by smoke.

Sink: The medium which retains and interacts with a pollutant

E.g.: Oceans and green plants are sinks for CO_2

11. Define the term TLV?

Ans. TLV (Threshold Limit Value): The permissible level of the toxic substances (or) pollutants in the atmosphere, which affects a person adversely when he is exposed to this for 7 - 8 hrs. in a day is called TLV.

E.g.: TLV of carbon monoxide is 9 ppm.

12. Write any two effects of polluted water?

Ans. It damages the agriculture sector, aquatic life and also causes diseases for human beings

13. What happens when CO concentration is increased in atmosphere?

Ans. CO binds to haemoglobin to form Carboxyhemoglobin which is 300 times more stable than the oxyhaemoglobin. Increase the concentration of Carboxyhemoglobin causes headache, weak eye sight etc.

14. What is green house effect?

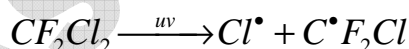
Ans. Some of the heat from the sun rays is trapped by CO_2 , CH_4 , O_3 , CCl_2 , F_2 gases and water vapour adds heat to the atmosphere this is called Green house effect.

15. What is harm caused by CFC'S?

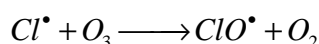
Ans. It damages the ozone layer, causes global warming.

16. Give the chemical equations involved in the ozone depletion by CF_2Cl_2 ?

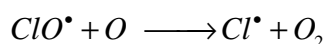
Ans. Chlorofluorocarbons released in to atmosphere mix with atmospheric gases and reach the stratosphere. There, they get broken down by powerful UV radiations, releasing chlorine free radical.



The chlorine radical reacts with O_3 to form chlorine monoxide radicals and oxygen.



Chlorine monoxide radical reacts with atomic oxygen produces more chlorine radicals.



The chlorine radicals are continuously regenerated and cause ozone depletion.

17. What is ozone hole? Where it was first observed?

Ans. Depletion of ozone layer commonly known as ozone hole. Chlorofluorocarbons released in to atmosphere mix with atmospheric gases and reach the stratosphere. There, they release chlorine free radical which causes ozone depletion.

In summer season NO_2 and CH_4 react with chlorine monoxide and chlorine atoms forming chlorine sinks prevent ozone depletion. Ozone hole was first observed over the South Pole.

18. Define the terms Atmosphere, Biosphere, Lithosphere, Hydrosphere?

Ans. Atmosphere: - Atmosphere is the protective blanket of gases surrounding the earth.

Biosphere: - All living species including human beings and animals constitute Biosphere.

Lithosphere: - Lithosphere is the outer mantle of the solid earth consisting of minerals and the soil.

Hydrosphere: - All the natural water resources together constitute the hydrosphere. These include oceans, seas, rivers, lakes, streams, reservoirs, glaciers, etc.

19. List out four gaseous pollutants present in Troposphere?

Ans. The major gaseous pollutants in Troposphere are oxides of sulphur, nitrogen and carbon, hydrogen sulphide, hydrocarbons, ozone and other oxidants.

20. Name three industrial chemicals that pollute water?

Ans. Various industrial chemicals that pollute water are polychlorinated biphenyls. Detergents and fertilizers.

22. What agrochemicals are responsible for water pollution?

Ans. Sodium chlorate, Sodium arsenate, Aldrin Dieldrin, etc. are responsible for water pollution.

23. What is PAN? What effect is caused by it?

Ans. PAN is peroxyacetyl nitrate. Ozone reacts with unburnt hydrocarbons in the polluted air in the presence of strong oxidising agents like NO_2 to produce chemicals such as formaldehyde, acrolein and PAN. PAN is a powerful eye irritant.

