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TEXTBOOK QUESTIONS SOLVED

Question 1. Define environmental chemistry?
Answer: Environmental Chemistry is the branch of science which deals with the chemical changes in the environment. It includes our surroundings such as air, water, soil, forest etc.

Question 2. Explain the tropospheric pollution in 100 words?
Answer: Tropospheric pollution occurs due to the presence of undesirable substance in air. These may be the solid or gaseous pollutants.

- Gaseous Air Pollutants: These are oxides of sulphur, nitrogen and carbon, hydrogen sulphide, hydrocarbons, ozone and other oxidants.
- Particulate Pollutants: These are dust, mist, fumes, and smog etc.

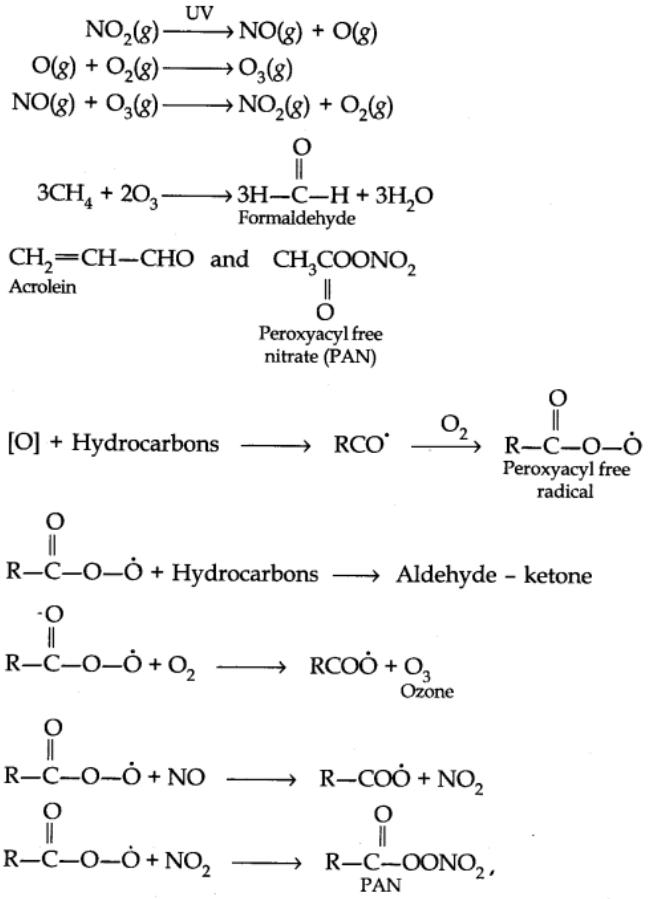
Question 3. Carbon monoxide gas is more dangerous than carbon dioxide gas. Why?
Answer: Carbon monoxide combines with haemoglobin to form a very stable compound known as carboxyhaemoglobin when its concentration in blood reaches 3-4%, the oxygen carrying capacity of the blood is greatly reduced. This results into headache, nervousness and sometimes death of the person. On the other hand CO_2 does not combine with haemoglobin and hence is less harmful than CO.

Question 4. Which gases are responsible for greenhouse effect? List some of them.
Answer: CO_2 is mainly responsible for greenhouse effect. Other greenhouse gases are methane, nitrous oxide, water vapours, CFCs and Ozone.

Question 5. Statues and monuments in India are affected by acid rain. How?
Answer: This is mainly due to the large number of industries and power plants in the nearby areas. Acid rain has vapours of sulphuric acid dissolved in it. When it comes in contact with various statues or monuments, the acid reacts chemically with calcium carbonate.
$CaCO_3 + H_2SO_4 \rightarrow CaSO_4 + H_2O + CO_2$

Question 6. What is smog? How is classical smog different from photochemical smog?
Answer: The word smog is a combination of smoke and fog. It is a type of air pollution that occurs in many cities throughout the world. Classical smog occurs in cool humid climate. It is also called as reducing smog.Whereas photochemical smog occurs in warm and dry sunny climate. It has high concentration of oxidising agents and therefore, it is also called as oxidising smog.

Question 7. Write down the reactions involved during the formation of photochemical smog.
Answer: Mechanism of formation of photochemical smog:



Question 8. What are the harmful effects of photochemical smog and how can they be controlled?
Answer: Harmful effects of photochemical smog:

- Their'high concentration causes headache, chest pain and dryness of the throat.
- Ozone and PAN act as powerful eye irritants.
- Photochemical smog leads to cracking of rubber and extensive damage to plant life.
- It causes corrosion of metals, stones, building materials, and painted surface etc.

Control:

- Use of catalytic converter in automobiles prevents the release of nitrogen dioxide and hydrocarbons to the atmosphere.
- Pinus, juniparus, quercus, pyrus etc. can metabolise nitrogen dioxide thus their plantation could help to some extent.

Question 9. What are the reactions involved for ozone layer depletion in the stratosphere?
Answer: The reaction can be shown as follows:
$CF_2Cl_2(g) + UV \rightarrow Cl(g) + CF_2Cl(g)$
$Cl(g) + O_3(g) \rightarrow ClO\ (g) + O_2(g)$
$ClO(g) + O(g) \rightarrow Cl + O_2(g)$

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