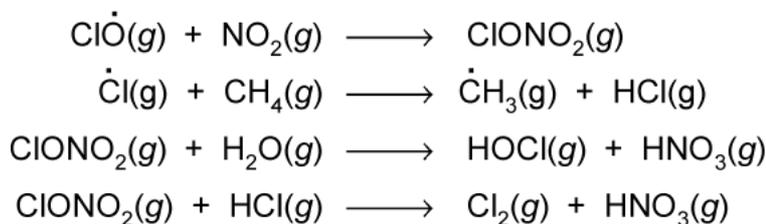


- Q1.** Name the acids which are present in acid rain.
- Q2.** What is the importance of measuring BOD of a water body?
- Q3.** Green house effect leads to global warming. Which substances are responsible for greenhouse effect?
- Q4.** (a) Carbon monoxide gas is more dangerous than carbon dioxide gas. Why?
(b) Statues and monuments in India are affected by acid rain. Why?
(c) What would have happened if the greenhouse gasses were totally missing in the earth's atmosphere?
- Q5.** Give reasons:
(a) Sometimes ago, formation of polar stratospheric clouds was reported over Antarctica.
(b) Carbon monoxide prevents transport the of oxygen in the body.
(c) Acid rain is considered as a threat to Taj Mahal.
- Q6.** (a) How classical smog is different from photochemical smog?
(b) Dinitrogen and dioxygen are main constituents of air but these do not react with each other at ordinary condition to form oxides of nitrogen, why?
(c) Give two compounds which are responsible for depletion of ozone layer.
- Q7.** (a) Why does London smog form in winters while photochemical smog form in summers?
(b) Explain the formation of ozone in stratosphere.
(c) How do chlorofluorocarbons cause thinning of ozone layer in stratosphere? Give chemical equations in support of your answer.

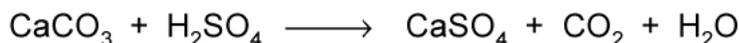
- S1.** The various acids present in acid rain are H_2CO_3 (formed from CO_2), HNO_3 (formed from NO and NO_2) and H_2SO_4 (formed from SO_2 and SO_3).
- S2.** Biological Oxygen Demand (BOD) is the measure of level of pollution caused by organic biodegradable material. These biodegradable materials are decomposed by microorganism (bacteria) consuming dissolved oxygen. Lower the value of BOD, less is the organic biodegradable matter present in water.
- S3.** The various gasses that causes greenhouse effect responsible for global warming with relative contributions are the following:

Various gasses	Relative contribution
Carbon dioxide	50%
Water vapour	2%
Nitrous oxide	4%
Ozone	8%
Chlorofluorocarbons	17%
Methane	19%

- S4.** (a) Carbon monoxide gas is a poisonous gas. It binds to haemoglobin of the blood to form carboxyhaemoglobin complex which is 300 times more stable than oxyhaemoglobin complex. When concentration of carboxyhaemoglobin reaches about 3-4%, the oxygen carrying capacity of blood is greatly reduced. This result into headache, nervousness and cardiovascular disorder.
- (b) The acid rain consists of H_2SO_4 , HNO_3 etc, that react with marble of statues and monuments.
- $$\text{CaCO}_3(s) + \text{H}_2\text{SO}_4(aq) \longrightarrow \text{CaSO}_4(s) + \text{H}_2\text{O}(l) + \text{CO}_2(g)$$
- As a result, these monuments are being slowly decayed away and marble is getting discoloured and lustreless.
- (c) Carbon dioxide, methane, water vapours, nitrous oxide, CFCs and ozone are greenhouse gases. These gases trap some of the heat radiated by the earth's object near the earth's surface and keep it warm. This is called natural greenhouse effect because it maintains the temperature and makes the earth perfect for life. If there were no greenhouse gases, the earth would convert into a cold planet and there would no life on earth.
- S5.** (a) In winter, special types of clouds called polar stratospheric clouds are formed over Antarctica because these polar stratospheric clouds provide surface on which chlorine nitrate gets hydrolysed to form hypochlorous acid. It also reacts with hydrogen chloride to give molecular chlorine.



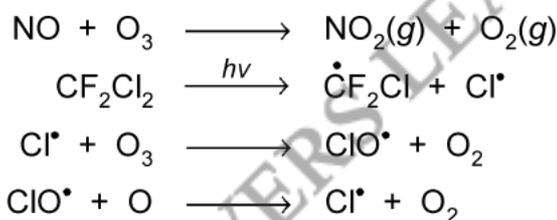
- (b) Carbon monoxide (CO) combines with haemoglobin to form more stable carboxyhaemoglobin complex due to which the transport of oxygen to the organs and tissues is blocked.
- (c) Taj Mahal is made up of marble (*i.e.*, CaCO_3). The acid rain contains H_2SO_4 which attacks the marble thereby, decolourising it and making it lustreless.



- S6.** (a) The differences between photochemical smog and classical smog are as follows:

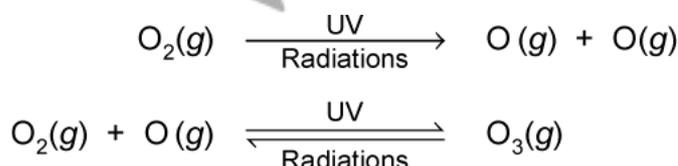
Classical smog	Photo chemical smog
Main components in classical smog are SO_2 , carbon particles and humidity in air.	In photochemical smog O_3 , Pan, RCHO and R_2CO .
Classical smog is reducing in nature.	Photochemical smog is oxidising in nature.

- (b) N_2 and O_2 do not react with each other as nitrogen is inert to react because the triple bond in N_2 is very stable and its dissociation energy is very high.
- (c) The compounds which are responsible for depleting ozone layer are (i) NO (ii) chlorofluoro carbon (CFCs).

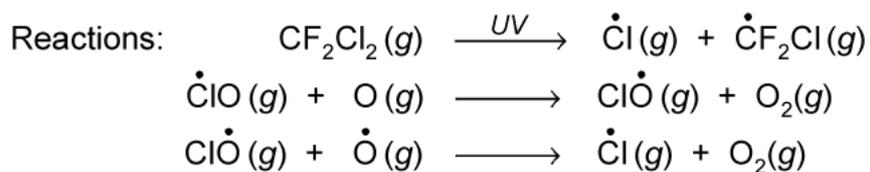


These reactions occur in stratosphere.

- S7.** (a) London smog is formed due to the condensation of sulphuric acid droplets (formed from SO_2) on the surface of the particulates which takes place in cold weather while photochemical smog is initiated by the photolysis of NO_2 which takes place in the presence of bright sunlight, hence form in the summer.
- (b) Ozone in stratosphere is a product of action of UV radiations on dioxygen (O_2) molecules. The UV radiations split molecular oxygen into free oxygen atoms. These oxygen atoms combine with the molecular oxygen to form ozone.



- (c) CFCs are stable compounds. These undergo decomposition in the presence of sunlight as shown below:



Chain reactions continue by which ozone layer gets depleted.

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