

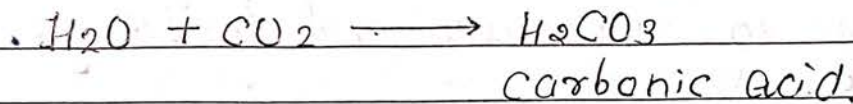
Unit-IV

(Current Environmental Issue of Importance)

-∴ Acid Rain :-

The term acid rain was first used by "Robert Angus Smith" in 1872

Normal rain water is slightly acidic because CO_2 present in atmosphere get dissolved in it formed carbonic acid.



Acid rain is caused by a chemical reaction when Sulphur di-oxide and nitrogen-di-oxide are released into the air. They rise very high into atmosphere where they mix and react with water, oxygen etc to form sulphuric acid (H_2SO_4) and nitric acid mixed with rain drops and come down as rain is known as acid rain.

→ causes of acid rain:-

Main causes of acid rain are the sources that emit acidic oxide. These are -

(i) Pollutants emitted by automobiles, aircrafts, ships etc.

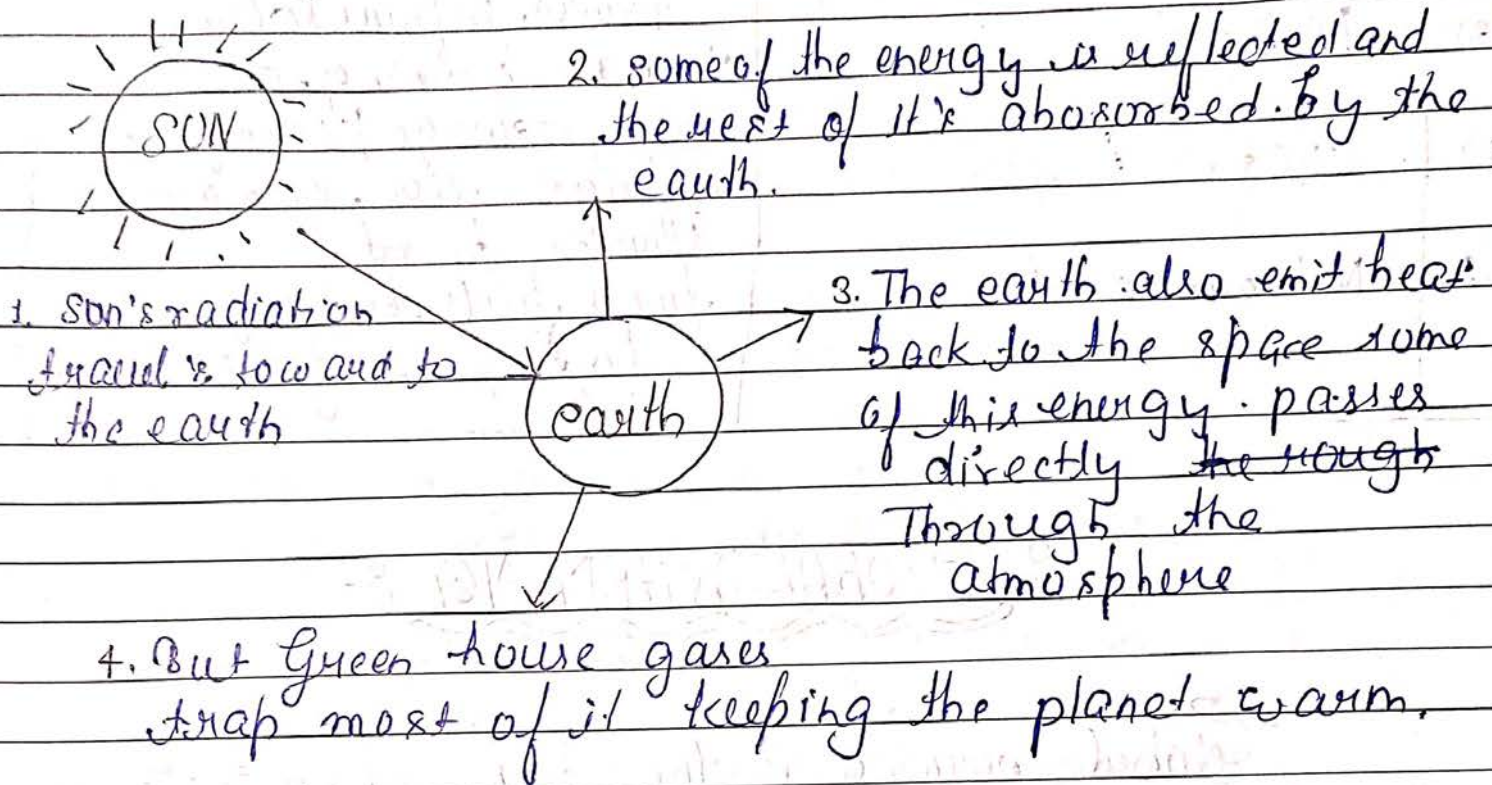
- (ii) pollutants emitted by thermal power plants and other industries
- (iii) pollutants emitted by acid manufacturing and explosive industries.

→ Effects of acid rain:-

The harmful effects of acid rain are the following-

- (i) Fresh water is spoiled and the fish population in ponds, lakes, and rivers is reduced.
- (ii) causes damage to structures and buildings, marbels etc.
- (iii) Due to acidity lakes, ponds, rivers etc the green algi and many form of bacteria are killed. Hence aquatic ecosystem is affected.
- (iv) The rate of corrosion of metals accelerates.
- (v) Due to acidity the earth bome are killed their population is reduced. It causes loss of soil fertility.
- (vi) NO_2 forms smoke in sunlight which causes breathing problems for visibility etc.
- (vii) Desolve Salt like CaCO_3 and other chemical compound in soil this result is lost of fertility of soil.

Green house Effect :-



The term green house effect first coined by "J. Fourier" in 1827.

Green house effect is the process by which radiation from the sun is absorbed by the green house and not reflected back into the space. due to this the surface of the earth gets heated up.

→ Green house Gases :->

S.no	Green house gases	Sources
1)	Carbon di-oxide	Fossil fuels burning, Industrial Process, Deforestation.
2)	Methane	Biomass burning, coal mining, sewage, Landfills
3)	CFCs	Refrigeration, Aerosols, Solvents
4)	Nitrous oxide	Fossil fuels burning, fertilizers, deforestation

GLOBAL WARMING :-

Global warming is the term which indicates the increase in the average temperature of the atmosphere.

causes of global warming:-

- (i) Burning of fossil fuels such as - coal, petroleum etc
- (ii) The CO₂ is released into atmosphere in the form of smoke by automobiles, ships etc.
- (iii) Deforestation by cutting down the forest lesser plants and trees are available to absorb CO₂.

(iv) population explosion due to much increase in population there is greater release of CO_2 in ~~atmosphere~~ atmosphere.

∴ effects of Global warming :-

(i) The excess of CO_2 will result into respiratory and suffocation.

(ii) The eco system will be unbalanced

(iii) average temperature of earth will go on rising above the normal temperature, causing tremendous changes in climate and ~~weather~~ weather, natural resources etc.

(iv) this may lead to melting of glaciers and polar ice ~~land~~ icecaps which merged into floods of many ~~coastal~~ coastal low line areas.

∴ Climate change ∴

Climate is the average weather in a given area over a longer period of time.

Climate change refers to long term shifts in temperature and weather patterns.

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These shifts may be natural, such as through variation in the solar cycle. But since the human activities have been the ~~may~~ main driver of climate change due to the burning of fossil fuels, which produce heat trapping gases.

Causes of climate change :-

Human activity is the main cause of climate change. People burn fossil fuels and convert land from forest to agriculture and ~~convert~~ land. Since the beginning of the Industrial Revolution, people have been burning more and more fossil fuels and changing vast areas of land from forest to farm land. This adds huge quantities of greenhouse gases to those naturally present in the atmosphere, increasing the greenhouse effect and global warming.

Effects of climate change :-

These climate changes have a negative impact on the environment. The ocean level is rising, glaciers are melting, CO₂ in the air is increasing, forest and wild life are declining and water life is also getting disturbed. Climate and due to the climate changes.

Population Growth

The meaning of population growth is the increase in the number of people in a given area.

-: Causes of population growth:-

1) Pop. preference of son's :-

One of the most distributing trends in India is the preference of son's, this attitude is found in strata of the society. and is not restricted to poor and uneducated people

2) Illiteracy :-

It is another factor responsible for high birth rate. people have no access to information related to family planning and hence are largely responsible for growth in population.

3) Migration :-

People may choose to migrate for a variety of reasons such as unemployment opportunities, environmental factors, educational purpose. OR reunite with family.

4) Decrease in the death rate due to improve medical facilities with the birth rate remaining the same.

5) Another reason for the high birth rate is the custom of child marriage.

Effects of population growth :-

- 1) It creates problem of food, clothing and shelters
 - 2) ~~less~~ lack in basic amenities of living such as in water supply, sanitation, health care etc.
 - 3) It creates difficulties in education
 - 4) It damage the environment and create the pollution.
 - 5) It is responsible for over crowding which leads to creation of slums.
 - 6) It is responsible for unemployment and migration in search of jobs
- It decrease per capita income.

-: Control of population Growth :-

- 1) Educating the people to keep a check on birth rate.
- 2) forcing the people through enforcement of law to limit the size of family.
- 3) Discovering more natural resources in terms of water, food and energy.
- 4) Providing incentive in terms of money for structuring smaller family.

-: Automobile Pollution :-

All motor vehicles release pollutants into the air, mostly through the exhaust fumes that come out of the tailpipe when the engine operates.

- more than 99.4% of all pollutant gases are invisible
- your car releases emissions even when it's standing still.
- other fumes from petrol and lubricants evaporate into the air.

Pollutants produced by vehicle exhausts include carbon monoxide, hydrocarbons, nitrogen oxides, particles, volatile organic compounds

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and Sulfur dioxide, Hydrocarbons and nitrogen oxides react with sunlight and warm temp. to form ground-level ozone. a main ingredient in smog, can cause upper respiratory problems and lung damage

-: Causes of automobile pollution :-

The major cause of vehicle pollution is the rapid increase in the number of vehicles. over the last few decades, most vehicles have been produced. The population of vehicles was about 1.4 billion in 2020 itself. The rapid growth in vehicles means more fuel is required which results in the emission of harmful gases in the environment that cause air pollution other major factors that contribute to the increase in vehicular pollution / automobile pollution in urban areas are poor fuel quality, use of old vehicles, congested traffic which results in smog, no proper traffic management, two-stroke engines, no proper maintenance

-: Effects of automobile pollution :-

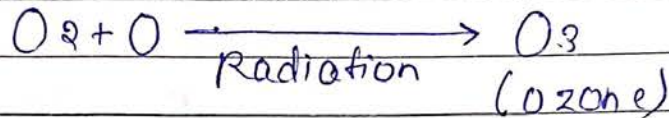
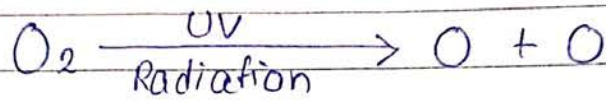
Global warming is considered to be the leading effects of vehicular / automobile pollution pollutants released from the vehicles result in the emission of greenhouse gases into the atmosphere which results in depletion of

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the ozone layer. Depletion of the ozone layer results in an increase in the atmospheric temperature which in turn causes global warming. Other effects of vehicular/ automobile pollution include smog and acid rain formation, reduction in the quality of air which affects tourism and it also causes health problems and lung-related diseases.

OZONE LAYER

The ozone layer is a thin part of earth atmosphere that absorb all most all of the sun harmful ultra violet light ozone is a molecule made up of three oxygen atoms, often reference as O_3 . Ozone in form heat and sunlight cause chemical reactions -



* Ozone Layer Depletion *

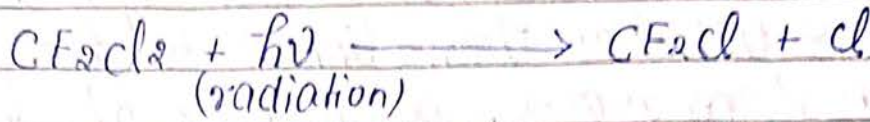
Ozone layer depletion is the destruction of ozone in the stratosphere, where it should shield the earth from harmful ultra violet radiation.

when oxide of chlorine, Bromine, nitrogen and hydrogen atom come into contact with ozone in the stratosphere, they destroy ozone molecules ozone depletion occurs when chlorofluorocarbon (CFC) formerly found in sprays, aerosols, refrigerators, air-conditioning

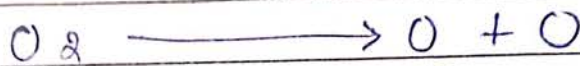
* Mechanism of ozone hole formation *

Although the chlorofluorocarbons are inert in physical reaction but they

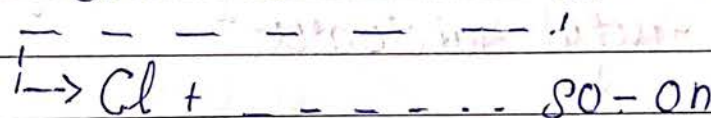
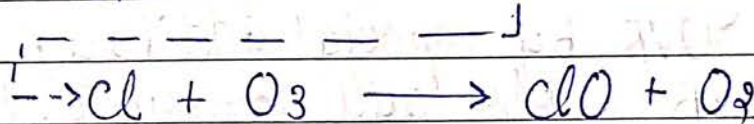
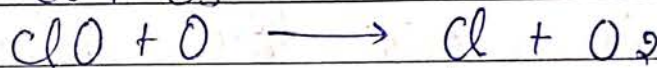
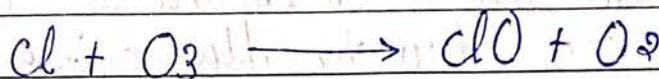
which is released high altitude conciently then they foratical cohoxe mechanism is explain to below by means of following reactions -



formation of ozone



Depletion of ozone



∴ Effects of Ozone layer depletion :-

There are following main effect ⁱⁿ below of ozone layer depletion -

1) Effect on human health: →

Ozone layer depletion increases the amount of UVB

that reaches the earth surface. Laboratory and epidemiological studies demonstrate that UVB causes non-melanoma skin cancer and plays a major role in malignant melanoma development.

In addition, UVB has been linked to the development of cataracts, a clouding of the eye's lens. Because all sunlight contains some UVB, even with normal stratospheric ozone levels it is always important to protect your skin and eyes from the sun.

2) Effects on materials :-

Synthetic polymers, naturally occurring biopolymers, as well as some other materials of commercial interest are adversely affected by UVB radiation. Today's materials are somewhat protected from UVB by special additives. Yet, increases in UVB levels will accelerate their breakdown, limiting the length of time for which they are useful outdoors.

3) Effects on Biogeochemical cycle :-

Increases in UVB radiation could affect terrestrial and aquatic biogeochemical cycles, thus altering both sources and sinks of greenhouse and chemically important trace gases (e.g., carbon dioxide, carbon monoxide, carbonyl sulfide, ozone, and possibly other gases).

These potential changes would contribute to biosphere-atmosphere feedbacks that mitigate or amplify the atmospheric concentrations of these gases.

4) Effects on plants :-

UVB radiation affects the physiological and developmental processes of plants. Despite mechanisms to reduce or repair their effects and an ability to adapt to increased levels of UVB, plant growth can be directly affected by UVB radiation.

Indirect changes caused by UVB (such as changes in plant form, how nutrients are distributed within the plant, timing of developmental phase and secondary metabolism) may be equally or sometimes more than damaging effects of UVB. These changes can have important implications for plant competitive balance, herbivory, plant disease, and biogeochemical cycles.

Burning of Paddy straw :-

Stubble burning is a method of removing paddy crop residues from the field. It is done from the last week of September to November.

After paddy is harvested, in mid and late October, the fields are left with a stubble of stalks about two feet high. Because the sowing cycle for wheat begins in late October, farmers have very little time to prepare their fields so they typically set fire to the stubble and then clear the residues.

Effects of burning of paddy straw

- 1) In addition to its effects on air quality.
- 2) Stubble burning also affects the soil fertility through the destruction of its nutrients.
- 3) Smoke from burning vegetation contains toxic gases such as carbon mono-oxide, carbon di-oxide and other green house gases that enter the lungs and affect respiratory system.

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∴ Controls of burning of Paddy straw :-

The best sustainable and most eco friendly solution is to harvest paddy manually, which leaves no stubble to burn.

After manual harvesting and manual threshing paddy residue is used as wooden fodder for animal that convert it into milk or animal power.

A part is used as bedding for animals in the winter.