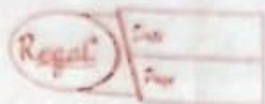


(Ch-5)
Environmental Effects



Environmental pollution :- Any undesirable change of the physical, chemical or biological characteristics in the air, water and land which is harmful to man directly or indirectly through his animals plants industrial or any other materials is called as environmental pollution.

Environmental pollution can be categorised into two types :-

(i) Natural pollution :- It originates from natural pollution.

Ex → volcanic eruption, flood, radio active substance, Pollen grains of flowers, forest fire and coal mine fire, excreta of animal

Bacterial decomposition of agricultural matter.

~~Bacterial decomposition of agricultural matter :-~~

(ii) Artificial pollution :- It originates from the activities of man. Environmental deterioration by man is attributable to these major factors.

- (i) Overpopulation
- (ii) Urbanisation
- (iii) Industrialisation

Pollution means :-

- (i) The presence of anything in environment in excess of requirement amount anything put into atmosphere in its nature.
- (ii) Direct or indirect change one or more components which are harmful for living organisms.

Pollutants :-

→ Pollutants are Chemical Biological or physical agent that exert undesirable effect on living organisms, ~~in~~ including human health, environment or belongings.

A/c to "The Indian environment protection act, 1986", Pollutants has been defined as any solid, liquid or gaseous substance present in such concentration as may be or may tend to be injurious to the environment.

(iii) Segrate smoke contents about 2% of (CO) due to incomplete combustion of Tobacco.

(iv) Carbon monoxide is generated during several operations in iron and steel industries.

Harmful effects of (CO) Carbon monoxide:

(i) During breathing the haemoglobin present in the red blood cell combine with O_2 to form oxyhaemoglobin. The oxyhaemoglobin travels through arteries to give up oxygen and take up CO_2 in return, which is exhaled. In case the air we breathe contains CO it combines with haemoglobin and form Carboxy Haemoglobin ($HbCO$) due to which the quantity of oxygen available to the body cells get reduced which causes "anoxia" the deficiency of oxygen produces headache, dizziness, choking, Cardiac arrest, paralysis, etc.

Oxides of (SO₂) Sulphur :-

(i) Source :- 67% of the total volume of SO_2 present in atmosphere is released by volcanic eruption and rest 33% is discharged due to human activity.

(4) Forest fire :-

(b) Man-made source :- Incomplete Combustion of fossil fuels of

(ii) Solvents used in industrial operations escape into air due to evaporation.

Effects:- (i) Hydrocarbons are it Causes Cancer.

(ii) It harm plants causing ageing, shedding of leaves, flowers etc.

(iii) Methane traps 20% more heat than CO2 and thus become important green house gas.

(5) Particulates or suspended particles :- Particulates refers to all atmospheric substances that are not gases i.e, they are minute solids or liquid droplets. The size of particulates may range from 0.0002 μ diameter to 5000 ($1 \mu = 10^{-6}m$)

Source:-

(a) Mist :- These are these particles that are produced by spraying liquid and formed by the condensation of vapours in air.

ex. → Insecticides, herbicides.

(b) Smoke :- These are produced by burning and combustion of organic matter. Wet smoke, tobacco smoke and carbon smoke are their examples.

(c) Fumes :- These are condensed vapours. These are generally released into inchemical or metallurgical process.

(d) Dust :- These are fine particles formed by natural process like disintegration of rocks by mechanical process.

Effect :-

(i) Effects on human beings :-

Oxides of nitrogen ^(NO_x) :-

Source :-

- (i) Natural source :- (i) Thunderstorm
(ii) Bacterial decay of organic matter

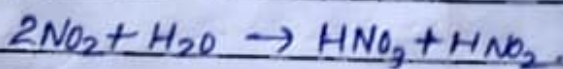
- (ii) Man-made source :- (i) Combustion of fossil fuel such as coal, oil, natural gases, etc.

(ii) Chemical Industries

Effects :-

(i) NO₂ is extremely toxic to living tissues.

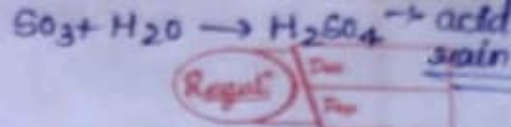
(ii) When combines with moisture present in atmosphere, it also causes acid rain.



Hydrocarbons :-

These are chemical compounds of carbon and hydrogen only. Methane is the main hydrocarbon present in the atmosphere.

Main sources are :- (a) Methane is emitted during anaerobic decomposition of organic matter.



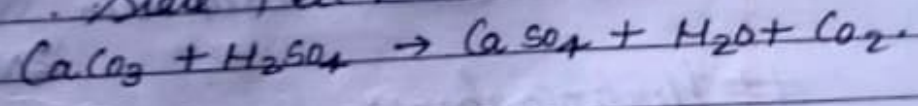
Therefore the ~~main~~ man-made sources of SO_2 are :-

- (a) Coal Combustion
- (b) Combustion of petroleum & its products.
- (c) During extraction of sulphide ores like Pyrite
- (d) Many industries such as paper, petroleum refining, sulphuric acid, etc, release SO_2 into atmosphere.

(e) effects of oxides of sulphur.

(i) Higher concentration of SO_2 may cause lung disease and even lung cancer. SO_3 is more harmful than SO_2 .

(ii) Oxides of sulphur in the form of acid effect number of materials.
 for ex :- (a) Buildings materials such as lime stone, marbles, slate, etc.



(b) Metals, particularly iron gets corroded.

(iii) It also effects plants.

2/6/20
Regal

Major Air Pollutants of Tropospheric pollution :-

- (i) Carbon monoxide
- (ii) Oxides of Sulphur
- (iii) Oxides of Nitrogen
- (iv) Flyash Carbon
- (v) Fine Particulate or Suspended Particles.

1) Carbon monoxide \div CO is the colourless, tasteless and odourless gas. It is 96.5% as heavy as air and it is not appreciably soluble in water. The main source of CO, a CO₂ :- (a) natural source :-

- (i) volcanic eruption
- (ii) forest fire
- (iii) mither
- (iv) decomposition or degradation of Chlorophyll

(b) Man-made source :- (i) incomplete combustion of fuel containing Carbon.

(ii) Carbon monoxide is ejected from waste disposal combustion coal mines and power plants. A

(iii) ~~Sequester Smoke~~ etc.

Types of Pollution

- (i) Air pollution
- (ii) Water pollution
- (iii) Land pollution.

(i) Air pollution → Air pollution can be defined as any atmospheric condition in which certain substances are present in such concentration they can produce undesirable effect on man and his environment.

mainly we study air pollution of two lower parts of atmosphere i.e., up to height of 50 km. Therefore air pollution are of two types :- (i) Tropospheric Pollution (ii) Stratospheric Pollution.

Stratospheric Pollution : The main pollutant of this part of atmosphere are gases such as oxides of nitrogen, oxides of sulfur, hydrocarbon etc. & particulated matter such as dust, smoke, mist & fumes etc.

Stratospheric Pollution : Stratospheric pollution is mainly due to depletion of ozone which may affect plants and human life adversely as UV radiations reach the earth.

Types of Pollutants :-

1) Non-biodegradable pollutants :- These are substances like inorganic salts, aluminium, carbon monoxide, ferrous chemical, pesticides etc which either do not separate or degrade and PCO system slowly. This is naturally these substance are harmful even at long concentration.

2) Biodegradable pollutants :- These are domestic waste which can be rapidly decomposed under natural process by microorganism.

Ex -> (i) Deposited matter ~~garbage~~
 (ii) Gases - oxides of nitrogen, nitrogen di-oxide, carbon monoxide.

(iii) Fluids
 (iv) Sulphuric acid, nitric acid, radio active waste noise and heat etc.

- (i) overpopulation
- (ii) urbanisation
- (iii) Industrialisation

Pollution means :-

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