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Architecture

19/sci18/014

Air pollution, its effects and causes and how to control it

The World Health Organization defines air pollution as “the presence of materials in the air in such concentration which are harmful to man and his environment.” In fact air pollution is the occurrence or addition of foreign particles, gases and other pollutants into the air which have an adverse effect on human beings, animals, vegetation, buildings, etc.

**Cause of Air Pollution**

1. Chemical industries including pesticides, fertilizers, weedicides, fungicides.
2. Combustion of natural gas, petroleum, coal and wood in industries, automobiles, aircrafts, railways, thermal plants, agricultural burning, kitchens, etc. (soot, flyash, CO2, CO, nitrogen oxides, sulphur oxides).
3. Cosmetics
4. Welding, stone crushing, gem grinding.
5. Processing industries like cotton textiles, wheat flour mills, asbestos.

 Natural air pollutants include (a) pollen, spores, (b) marsh gas, (c) volcanic gases and (a) synthesis of harmful chemicals by electric storms and solar flares. The major cause of pollution in the urban areas is automobiles which inefficiently burn petroleum, releases 75% of noise and 80% of air pollutants. Concentration of industries in one area is another major cause of air pollution.

**Effect of Air Pollutants**

**1. Particulate Matter:**

It is of two types—settle able and suspended. The settle able dusts have a particle longer than 10 (am. The smaller particles are able to remain suspended for long periods in the air. The important effects of particulate matter are.

1. Dust and smoke particles cause irritation of the respiratory tract and produces bronchitis, asthma and lung diseases.
2. Smog is a dark or opaque fog which is formed by the dust and smoke particles causing condensation of water vapours around them as well as attracting chemicals like SO2, H2S, NO2, etc. Smog harms plant life through glazing and necrosis besides reduced availability of light. In human beings and animals it produces respiratory troubles.
3. Particulate matter suspended in air, scatters and partly absorbs light. In industrial and urban areas, sunlight is reduced to 1/3 in summer and 2/3 in winter.

**2. Carbon monoxide**

It accounts for 50% of the total atmospheric pollutants. It is formed by incomplete combustion of carbon fuels in various industries, motor vehicles, hearths, kitchens, etc. Carbon monoxide combines with hemoglobin of blood and impairs its oxygen carrying capacity. At higher concentration, carbon monoxide proves lethal.

**3. Sulphur Oxides**

They occur mainly in the form of sulphur dioxide. It is produced in large quantity during smelting of metallic ores and burning of petroleum and coal in industries, thermal plants, home and motor vehicles. In the air, SO2 combines with water to form sulphurous acid (H2SO3) which is the cause of acid rain. It causes chlorosis and necrosis of vegetation. Sulphur dioxide, above 1 ppm, affects human beings. It causes irritation to eyes and injury to respiratory tract. It results in discoloration and deterioration of buildings, sculptures, painted surfaces, fabrics, paper, leather, etc.

**4. Carbon dioxide**

Due to excessive combustion activity, the content of C02 has been steadily rising. As carbon dioxide accumulates in the atmosphere it absorbs more and more of the reflected infrared radiation. This could cause an increase in temperature referred to as the green house effect. Melting polar ice caps and glaciers could cause sea levels to rise, flooding most of the major population centres and fertile lands.

**Control of Air Pollution:**

1. Industrial estates should be established at a distance from residential areas.

2. Use of tall chimneys shall reduce the air pollution in the surroundings and compulsory use of filters and electrostatic precipitators in the chimneys.

3. Removal of poisonous gases by passing the fumes through water tower scrubber or spray collector.

4. Use of high temperature incinerators for reduction in particulate ash production.

5. Development and employment of non-combustive sources of energy, e.g., nuclear power, geothermal power, solar power, tidal power, wind power, etc.

6. Use of non-lead antiknock agents in gasoline.