

INTERMEDIATE

- The atmosphere is the gaseous envelope surrounding our planet and consists of
- nitrogen (79.1%)
- oxygen (20.0%)
- carbon dioxide (0.03%)
- traces of other gases like argon, krypton, xenon, neon, helium, water vapour, ammonia, ozone and suspended particles (0.07%).
- But today, the percentage of carbon dioxide has increased causing the greenhouse effect due to which the earth is heating up, the polar ice caps are melting, and the ozone layer is disturbed.

We need oxygen for our existence.

Air Pollution

We have poisoned the air, water and soil with pollutants and have upset natural communities in ways that are affecting our place in the complex system that has come to be known as "the great chain of life". We may soon be tipping the balance of the natural forces in the land, atmosphere and oceans in ways that could be disastrous for mankind. In fact we have reached a point where we must protect the environment in order to protect ourselves.

In India alone, stupendous amounts of air pollutants enter the atmosphere per annum. The pollutants comprise of 50 lakh tonnes of particulate matter, 30 lakh tonnes of sulphur dioxide, 10 lakh tonnes of carbon monoxide and 22 lakh tonnes of hydrogen sulphide.

Clean air, which is essential for the survival of all living organisms, is rapidly becoming scarce. At mean sea levels air contains 20.94% oxygen and 78.09% nitrogen. Other elements present comprise less than one percent of its composition.

Air pollution can be due to natural or man-made causes. The former is beyond our control as natural disasters like dust storms, earthquakes and volcanic eruptions throw up large quantities of dust and gases into the atmosphere. Man-made causes, however, should be prevented or controlled as they pose a greater danger by way of toxic emissions from factories, power plants, vehicular traffic, etc. Industries such as mining, thermal plants, brick kilns, etc. also pollute the air. These emissions are particularly intense in urban conglomerations where the density of human habitation is very high.

TYPES OF AIR POLLUTANTS

- Primary pollutants are those which are emitted directly into the atmosphere, like sulphur dioxide, nitric oxides and carbon monoxide.
- Secondary pollutants are pollutants formed by the photochemical reaction of primary pollutants. For example, "smog", is a combination of smoke and fog. Smoke consists of carbon particles and fog is an emulsion of water vapour in air. Smog has become very common in large cities, especially during winter. Similarly acid rain is formed by the combination of sulphur dioxide and water vapour present in the air.

Pollutants in the air can be dispersed by wind movement, temperature and topography.

MAJOR AIR POLLUTANTS AND THEIR EFFECT ON HUMAN HEALTH

Pollutant	Origin of Pollutant	Effects
Sulphur dioxide	industries, especially where coal or oil are used as fuel	irritation of eyes, and respiratory system, increased mucus production, cough and shortness of breath
Carbon monoxide	automobile exhaust and industries	reduction in oxygen-carrying capacity of blood
Oxides of nitrogen	automobile exhaust	irritation of pulmonary tract affecting functioning of lungs
Hydrocarbons Chlorine	automobile exhaust chloralkali industry	lung cancer irritation of mucous membrane
Ammonia	fertiliser industry, agriculture and in poultry farming	irritation of mucous membrane
Hydrogen sulphide	manufacture of coke, viscose rayon, distillation of tar and petroleum	excessive inhalation leads to death
Acids and aldehydes	chemical industries	eyes, nose and throat irritation
Suspended particulate matter (SPM)	industries, automobile exhaust	respiratory diseases
Dust	industries and automobile exhaust	silicosis
Asbestos	roofings, brake linings	asbestosis
Lead	automobile exhaust	cumulative poison, impairment of central nervous system
Beryllium	aerospace industry, hold appliances	fatal to heart and manufacture of house- lungs
Manganese	mining operations	damages nerves and reproductive systems
Benzene	automobile exhaust and manufacture of chemicals	leukemia, chromosomal damage
Pesticides	manufacture and application of pesticides	depression; leads to death if inhaled in excess
Arsenic	thermal power plants	toxic

Other effects of air pollution

- Ozone causes reduced pollination and yellow spot formation on leaves, thus affecting the rate of photosynthesis.
- Sulphur dioxide is converted to sulphuric acid in the presence of moisture and iron, which are present in dust, nails, etc. This results in yellowing, weakening and corrosion of materials.