

Global air pollutants

They are pollutants that can reach all regions of the globe and include:

I / global warming: The reason for this phenomenon is the high level of pollutants from greenhouse gases, which are CO_2 , CH_4 , N_2O , chlorofluorocarbons (CFCs), water vapor as well as particle matters.

The photosynthesis process cannot consume a large increase in the carbon dioxide resulting from combustion processes (Combustion of fuels alone releases an amount of 18 billion tons annually).



combustion of coal



natural gas combustion

Greenhouse gases lead to a rise in the temperature on the surface of the Earth (trapped infrared radiation) causing the greenhouse phenomenon, this phenomenon leads to melting ice and increasing floods, affecting coastal cities, it also leads to increased desertification and forest fires ... etc.

II / Ozone: The chlorofluorocarbons (CFCs) are used in spray cans, perfumes, and liquids used in refrigerators and air conditioners are responsible for depleting the ozone layer in the stratosphere (Industrial cities are trying to replace these compounds with others that are not harmful to the ozone layer). Other compounds that contribute to depletion of the ozone layer are nitrogen monoxide and organic chlorine compounds such as pesticides (DDT and Aldrin). One chlorine atom can destroy hundreds of molecules of ozone and convert them into oxygen according to the following equations :



The ozone layer has the ability to absorb wavelengths that are shorter than 300 nanometers, which are UV rays from the sun and harmful to humans.

Ecological pollution Lect.6 Prof. Dr. Munther H. Rathi

III / Radiation Pollution : One of the most dangerous pollutants in the air at the present time , which causes cancer and affects the genetic characteristics of future generations. It is measured in units of **Gray (Gy) , Rad, Rem, Sievert (Sv) , Curie (Ci) , Becquerel (Bq) etc.**

Sources of radiation:

1- Natural sources: sunlight and rocks, some of which contain small amounts of radioactive materials such as radioactive potassium (they were not of high concentration, as living organisms adapted to them).

2- Industrial sources: medical diagnostics and radioactive materials resulting from the manufacture of nuclear fuel, nuclear explosions and materials resulting from nuclear research, agricultural, physical, chemical and industrial research ..etc.

Q/ What are the types of radiation and what are the most important differences between them?

Alpha particles	Beta particles	Gamma rays	X - Rays
Particles consisting of the nucleus of a helium atom consisting of two neutrons and two protons	Particles consisting of negatively charged electrons,	Rays not particles	Rays not particles
we can stop its path by a piece of paper or by the human body	we can stop its path by a piece of wood	We can stop its flow by placing a concrete barrier	we can stop its penetration by a piece of Pb a few millimeters thick
Its penetration force is less than Beta	Its penetration force is greater than alpha	It has a very high penetration force, It can easily penetrate the human body and be absorbed by the tissues	Its penetration force is less than the Gamma rays and are considered to be one of the most common sources Human exposure to radiation

Q/ What are the most important factors that influence radiation on the organism?

- 1- Species of the organism
- 2- degree of radiation
- 3- period of exposure

Death resulting from exposure to doses of 1 - 5 gray is caused by damage to the blood-generating tissues, and in higher doses the cause of death is due to damage to the digestive system. When the doses rise more, death is the cause of damage to the central nervous system.

Some types of pollution

Noise pollution : It is defined as unwanted voices that negatively affect the human nervous system and usually occur due to industrial development, the noise intensity is measured in **Decible (dB)**.

Some of the factors that affect hearing due to noise :

- 1- The noise level and its frequency
- 2- The type of noise
- 3- The daily exposure period
- 4- Continuity of work in the year
- 5- Change the effect of noise from one person to another
- 6- Nature of the place (house, factory, desert). The timing of the occurrence of noise (day or night), for example, the ringing of the phone during sleep may be very disturbing, while it is acceptable in some way during the day.

Food contamination: Food contamination occurs from the following sources:

- 1- Living organisms such as bacteria, fungi, eggs of worms, single-celled organisms, etc., and this is done through the air, insects and rodents.
- 2- The interaction of food with the plates used for cooking or preserved in them, which leads to a high percentage of minerals in the food
- 3- Adding coloring materials and flavoring materials, and it is believed that they are related to cancerous diseases.
- 4- Adding toxic nitrogen compounds in the food industry as preservatives

Drug pollution: Many of the antibiotics have a negative effect, especially during pregnancy, as well as some drugs that cause side effects, especially if the patient has more than one disease. As well as, drug interactions between some drugs if the patient takes them together, as they interfere with each other and negative effects on his health occur (Medicines must be taken at the times and dosages specified by the doctor) .

Oil pollution: The oil and its derivatives are considered highly toxic due to the oil containing toxic gases as hydrogen sulfide (H₂S). Oil affects and harms marine organisms, especially fish, causing poisoning or death. Spilled oil affects factories and oil refineries for the risk of fire or explosions . As well as, the possibility of mixing drinking water with toxic hydrocarbons resulting from the decomposition of oil.

Sources of oil pollution:

A- Natural Sources: (Natural Oil Seeps)

B - Industrial sources: (Accidents and seeps of ships, oil refineries, waste from fuel stations and factories ..etc.