Environmental Chemistry

Introduction

Earth is composed of numerous minute substances and particles which are involved in reactions leading to the formation of new ones. Hence the earth is said to be a closed system and the energy comes and leaves the planet, of which most of the mass stays here. This means that all the elements on this planet are continuously recycling within the environment. For example, consider free molecules of oxygen which were floating in the atmosphere yesterday and it might be the part of someone's hamburger the next day. It's all up to the chemists to study these cycles and to watch their movements. Hence the Environmental Chemistry can be defined as:

“The field of chemistry that deals with the study of reactions, sources, transport, effects, along with the fates of all the chemical species present in the soil, water, and the air environments, and also the effects of technology thereon.”

What is Environmental Chemistry?

Environmental chemistry is the scientific study of the biochemical and chemical phenomena that occur in natural places. Environmental chemistry is a study which is more than air, water, soil, and the chemicals. This field uses various techniques of biology, math, genetics, engineering, hydrology, toxicology, etc. that will help to fetch an answer to all the questions related to the environment.

Environmental chemistry also contains aspects of analytical chemistry, physical chemistry, organic chemistry & inorganic chemistry as well as more diverse areas, such as epidemiology, public health, biochemistry, biology, & toxicology.

Environmental chemists are responsible for finding how the unpolluted environment functions and to find ways of sustainable development which does not harm the environment.

One component which a lot of environmental chemists come across are contaminants and a good portion of our environment is a victim of contamination.

Contamination

Contamination of the environment takes place when there are unwanted chemical substances present in the atmosphere. In fact, environmental chemistry mainly deals with the study of these unwanted substances and their effects. Some of the contaminants of the environment are mentioned below.

- **Small contaminants**: Small contaminants are those metal particles which can be easily measured and controlled. These particulate contaminants can be monitored by the process of abrasion, fatigue and sifting.
- **Chemical Contaminants**: These are the pollutants which are produced by the process of chemical reactions. They contaminate the water and soil, and these are arsenic, nitrate, fluoride, manganese, iron, etc.
- **Gaseous contamination**: This type of pollution occurs through pollution of the gaseous atmosphere by the components such as sulfur, chlorine, bromine, etc.
- **Microbial contamination**: This is known to be one of the dangerous types of contamination as it does not only affects the environment but also the living system within it. The cause for this is the microbes such as the yeast, bacteria, mold, fungi, protozoa, viruses, or the toxins and by-products.

Applications of Environmental Chemistry
Some of the applications of environmental chemistry are mentioned below:

- Environmental Chemistry studies the risk factors of all the chemicals in-depth so as to get a solution for the safety purpose of the environment.
- It is applied in the study of new products and their effects on the environment.
- Environmental Chemistry is used in the method of protection of groundwater which is polluted by soil, dust, and the waste particles.
- It is useful for the protection of surface water from the contaminants through the process of sedimentation, bacteriological, and radiation.
- The quality of the soil is protected by the methods of environmental chemistry such as by the use of indicators like ecotoxicological and chemical.
- Impervious surfaces inside cities like the parking lots, rooftops & roads are prone to build up unwanted pollutants such as motor oil, gasoline, nutrients and sediment (soil), hydrocarbon compounds, metals.
- Environmental chemistry is applied in the Waste Management and Cleaner Production.