8.4.24

TENDER HEART HIGH SCHOOL, SEC-33B, CHD

CLASS- IX
CHAPTER- 8

SUBJECT- CHEMISTRY
TEACHER- MOHINISHA THAKUR

Good morning to all the students!

Students this lesson is for class - VIII for the subject of chemistry. Topic:- 'Natural sources of air pollutants' which is covered in chapter - 8 'Atmospheric pollution' starting on page no - 128 of your textbook titled - concise chemistry by 'Selina publication' and is being submitted to you on 8th April, 2024

All students may now please open page no - 128 of your notebook in front of you.

If all students are ready then let us start with this chapter. All students may now please listen carefully.

The environment comprises the physical and biological world in which we live, that is, air, water and land. It changes from region to region, since it results from a combination of different factors.

Industrial activities and faster modern modes of transport add harmful substances to the environment. These substances are harmful and potentially toxic. They are considered to

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be the principle cause of pollution.

The effect of undesirable changes in our surroundings that have a harmful effect on plants, animals and human beings are called Environmental Pollution.

The word 'pollution' is derived from the Latin word 'pollutes', which means "made dirty". Pollution is created by harmful substances generally produced by human beings. At times, nature also pollute the environment. The substances (pollutants) that contaminate and degrade earth's environment have an adverse impact not only on human life but also on plants and animals.

Toxic and otherwise harmful substances that have an undesirable impact on different components of the environment and life forms, are known as pollutants.

On the basis of their origin (sources), pollutants are of two types:- natural and man-made.

Natural sources of air pollutants

It consists of various sources such as:- (PoToO)

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* **Volcanoes :-** A large amounts of air pollutants such as carbon monoxide, sulphur dioxide, hydrogen sulphide, chlorine, hydrogen chloride, hydrocarbons and particulates releases are called volcanoes.

* **Decaying vegetation :-** An action of microbial on organic matter in soil releases pollutant i.e., nitrous oxide.

* A poisonous gas carbon monoxide release by forest fires.

* Particulate matter like sand and dust is carry by winds and dust storms.

Man - made sources of air pollutants

It also consists various sources such as :-

* **Automobiles :-** use diesel or petrol as fuel. Incomplete combustion of these fuels releases carbon monoxide, sulphur dioxide, hydrocarb-ons, nitrogen oxides and particulates like lead.

* **Factories :-** carbon dioxide, sulphur dioxide, nitrogen monoxide and particulates released by factories.

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* Industrial processes :-

It involves different types of air pollutants, depending upon the type of process involved

Examples :- Coal Power plants release carbon monoxide, sulphur dioxide, ash and smoke. Fertilizer industries release nitrogen oxides and ammonia.

* The main source of carbon monoxide and methane is decay of crop residue in rural areas.

* Burning of plastics releases carbon monoxide and other harmful gases.

Next, we will discuss the term 'Air Pollution'

AIR POLLUTION

Degradation of air quality due to concentration of harmful contaminants that affects human, plant and animal lives are called air Pollution.

Air pollution is caused due to the presence of gaseous pollutants like oxides of sulphur, nitrogen, carbon, hydrocarbons and particulate pollutants like dust, smoke, mist,

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Date :

Spray and fumes..

If composition of air is altered, it affects not only human life but also animal and plant life, and the atmosphere is then said to be polluted.

Students, you may observe 'Gaseous componen-ts of 'ordinary' dry air (non-polluted)' by Table 8.1 given on page no-129 of your Chemistry notebook.

Now, we will discuss the topic 'Gaseous pollutan-s and their effects'

Gaseous pollutants and their effects :-

* Sulphur dioxide affects yield of crops and causes damage to lungs
* Hydrogen sulphide gas reduces growth of crops and causes irritation to human eyes.
* Fluorides cause destruction of vegetation and affects teeth and bones.
* Nitrogen oxides cause death of many plants and are suspected to cause cancer.
* Carbon monoxide prevents haemoglobin from carrying oxygen to different parts of the body.
* Tobacco smoke causes lung cancer.
* Lead, which enters air from motor vehicles using tetraethyl lead, impairs the body's

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metabolic activities.

* Cotton dust produces lung fibrosis and smoke particulates cause asthma and other lung diseases.

SMOG

Oxides of nitrogen and sulphur and of partially oxidized hydrocarbons and their derivatives produced by industries and automobiles forms a dark, thick, dust and soot laden fog and is known as smog.

Smog is noxious and irritating. It reduces visibility, induces respiratory troubles, and can cause death by suffocation.

The other main pollutants together contribute to more than 90% of global air pollution, and they are as follows:-

* Nitrogen oxides (N_2O, NO and NO_2)
* Hydrocarbons (mainly methane, CH_4)
* Sulphur oxides (SO_2 and SO_3)
* Hydrogen sulphide (H_2S)
* Carbon monoxide (CO)
* Particulates (small solid particles and liquid droplets)

Next we will discuss the topic "Oxides of nitrogen as air pollutants".

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Oxides of nitrogen as air pollutants:-

Two gases nitric oxide (NO) and nitrogen dioxide (NO_2) enter the atmosphere in the following ways:-

* In furnaces burning of fuels increases temperature. On combining two gases present in air which is nitrogen and oxygen form oxides of nitrogen at high temperature.
* Oxides of nitrogen are produced when fuel burns in an internal combustion engine and they enter the atmosphere as exhaust gases from automobile engines.
* Nitric oxide is formed by the reaction between atmospheric nitrogen and oxygen in the presence of electric discharge, which happens during thunder storms, when there is lightning.

$$N_2 + O_2 \xrightarrow{\text{Lightning}} 2NO$$

* Nitric oxide further reacts with atmospheric oxygen (O_2) and ozone (O_3) to form nitrogen dioxide.

$$2NO + O_2 \rightarrow 2NO_2$$
$$NO + O_3 \rightarrow NO_2 + O_2$$

Students you may observe the 'Harmful effects of the oxide of nitrogen' by page no-130 of your chemistry notebook.

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Now, I will give you three a very short Questions. You will get a three minutes break to write the answers.

The Questions are :-

Q1:- The main source of carbon monoxide and methane is _____ in rural areas.

Q2:- Name two gases which causes air pollution.

Q3:- Name the gaseous pollutant which produces lung fibrosis.

I hope you all have written the answers by now. Let us check the answers now.

Ans1:- Decay of crop residue.

Ans2:- Oxides of sulphur and nitrogen.

Ans3:- Cotton dust.

Now, I am ending with this session by giving 'Instructions' & 'Homework'.

INSTRUCTIONS & HOMEWORK :-

You all are required to read the lesson again and revise all the topics covered in todays session. Do Questions 2, 3, 4, 5, and 6 of Exercise 8(A) of your notebook.