

OZONE

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Raniganj Girls' College

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Topic of the project: Different aspects of Air, Soil, Water, Noise pollution

A Project Report

Submitted by Semester-I students (Academic Year 2021-22)

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CERTIFICATE

This is to certify that this project titled “Different aspects of Air, Soil, Water, Noise pollution” submitted by the students for the award of degree of B.A. Honours/ Program is a bonafide record of work carried out under my guidance and supervision.

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Place: Raniganj

Date: 18.03.2022

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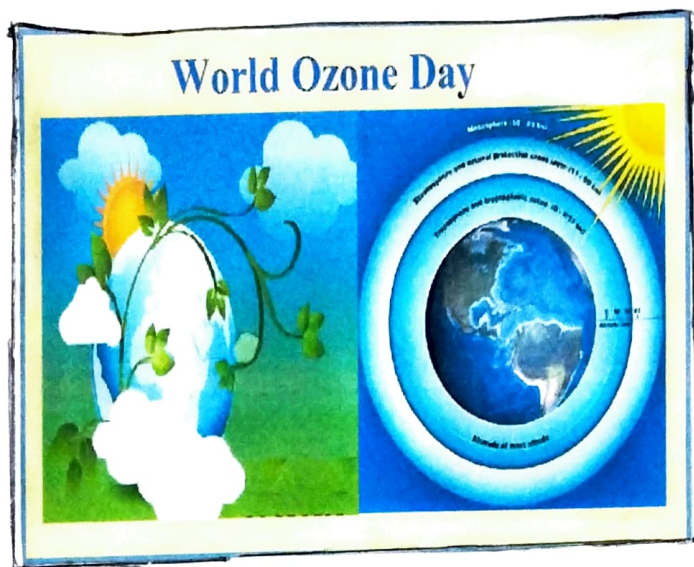
Signature of the supervisor with designation and department

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Acknowledgement

I would like to express my special thanks of gratitude to my professor as well as to our principal who gave me the golden opportunity to do this wonderful project on the topic "OZONE", which also helped me in doing a lot of Research and I came to know about so many things. I am really thankful to them. Hence, we can take a step forward to protect Ozone from depletion by air conditioning and refrigeration equipment that do not use HCFCs as refrigerant. Buy aerosol products that do not use HCFCs or CFCs as propellants also by conducting regular inspection & maintenance of AC & refrigeration and prevent & minimize refrigerant leakage.



▲ OZONE

INTRODUCTION

The ozone layer or ozone shield is a region of Earth's stratosphere that absorbs most of the Sun's ultraviolet radiation. It contains a high concentration of ozone in relation to other parts of the atmosphere, although still small in relation to other gases in the stratosphere. The ozone layer is mainly found in the lower portion of the atmosphere, from approximately 15-35 kilometers above Earth.

HISTORY :-

The ozone layer was discovered in 1913 by the French physicists Charles Fabry and Henri Buisson. It forms a protective layer that absorbs harmful ultraviolet light from the Sun. In 1985 an extreme depletion of ozone over Antarctica was discovered - the so-called Antarctica ozone hole. It soon became clear that this drop in ozone was caused by man-made chemicals called chlorofluorocarbons (CFCs). The ozone hole has developed because people have polluted the atmosphere with chemicals containing chlorine & bromine. The primary chemicals involved are CFCs, halons and carbon tetrachloride. It forms a protective layer that absorbs harmful UV light from the Sun. In 1985, an extreme depletion of ozone over Antarctica was discovered - the so-called Antarctic ozone hole. It soon became clear that this drop in ozone was caused by man-made chemicals called CFCs. The first ozone hole was discovered in a hole in the invisible shield that protects us from solar radiation.

> Where is ozone hole?

What we call the ozone hole is a thinning of protective ozone layer in stratosphere (the upper layer of Earth's atmosphere) above Antarctica that begins every September. Chlorine & Bromine derived from human-produced compounds are released from reactions on high-altitude polar clouds. Antarctica ozone hole is the 13th largest on record and expected to persist.

Ozone hole is harmful as it causes increased UV radiation levels at Earth's surface, which is damaging to human health. Negative effects include increases in certain types of skin cancers, eye cataracts, & immune deficiency disorders.

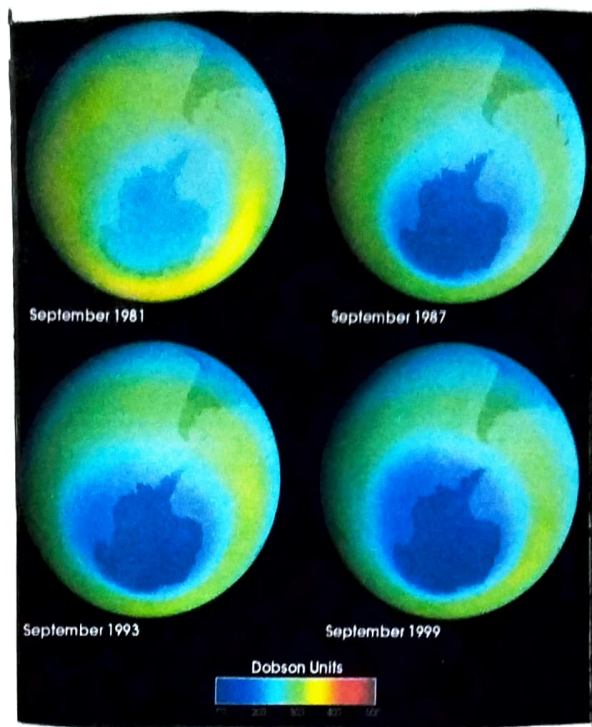
> Scientists also discovered that the thinning in the ozone layer was caused by increasing concentrations of ozone depleting chemicals - CFCs and to a lesser extent halons. Scientists detected it through satellite imagery conducted by NASA & in the USA. Subsequently, much scientific result has been going on. An annual data has been going on, and efforts by almost every country are being made to reduce the breaking down of ozone molecules. Many chemicals namely, chlorine and bromine are banned which are thought to cause the depletion of ozone layer.

► What is Ozone hole ?

- The ozone hole is not technically a "hole" where no ozone is present, but is actually a region of exceptionally depleted ozone in the stratosphere over the Antarctic, that happens at the beginning of the Southern hemisphere spring.

Satellite instruments provide us with daily images of ozone over the Antarctic region. The ozone hole is the region over Antarctica with total ozone of 220 Dobson Units or lower.

► There is one hole in the ozone layer at any given time. This hole forms during the coldest months of late winter when temperatures are low enough.

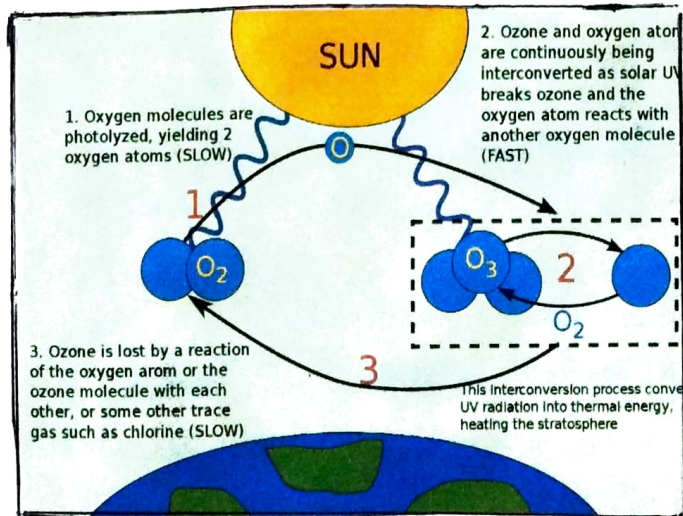


▲ ANTARCTIC OZONE HOLE

The Ozone layer : -

The ozone layer is a natural layer of gas in the upper atmosphere that protects humans and other living things from harmful UV radiation from the Sun. Although ozone is present in small concentrations throughout the atmosphere, most exists in the stratosphere, a layer 10 to 50 kilometers above the Earth's surface. The ozone layer filters out most of the Sun's harmful UV radiation and is therefore crucial to life on Earth.

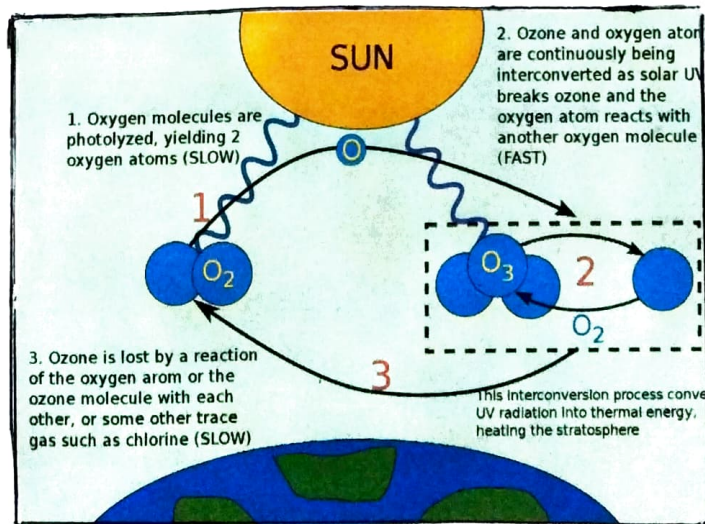
It is greatest at the South Pole. It occurs mainly in the late winter and early spring and peak depletion usually occurs in early October. When ozone is completely destroyed in large areas.

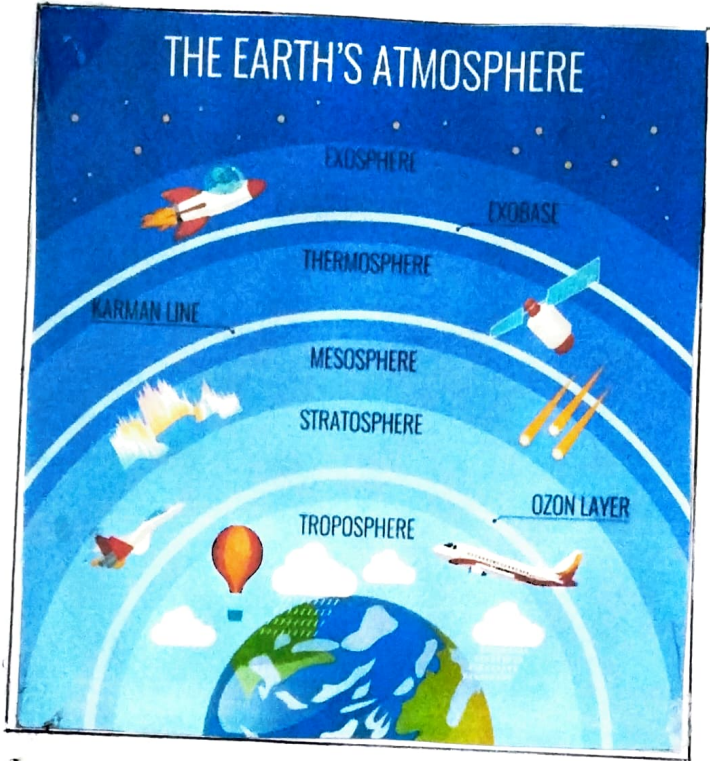


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▲ Ozone Layer

Effects of Ozone depletion for humans and environment: -

Ozone layer depletion causes increased UV radiation levels at the Earth's surface, which is damaging to human health.

Negative effects include increases in certain types of skin cancers, eye cataracts and immune deficiency disorders. UV radiation also affects terrestrial and aquatic ecosystems, altering grass food chains is particularly adversely affected by UV levels. UV rays also affect plant growth, reducing agricultural productivity, genetic & immune system. It leads to damage to DNA and leads to mutation, damage to skin cells, snow blindness

Causes :-

CFCs, halons, and other compounds, deplete the ozone layer. These chemicals are found in cleaning agents, aerosols, insulating foam & refrigerents, CFCs and halons break down into chlorine and bromine which in turn destroy the ozone layer.

Effects :-

- Humans - An increase in UV-B rays means a higher risk of skin cancer, eye cataracts, and blindness.
- Marine life - Phytoplankton and zooplankton are very sensitive to amount of light in their environment and increases in UV-B rays would greatly affect them. Because of these organisms are base of food chains, declines in their numbers would likely have effects on marine life.

These are microscopic marine organisms which play crucial roles in complex ecological food webs, are sensitive to UV radiation. Since, UV-B radiation is absorbed by only a few layers of cells.

• Plants —

UV-B rays negatively affect plants, including crops humans rely on. An increase in UV-B rays can mean smaller leaf size, decreased plant growth and lower quality crops for humans. Plants form the basis for most food chains.

Henri Buisson was a French
Physicist. Buisson & Charles
Fabry discovered the ozone
layer in 1913.



▲ Henri Buisson