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Animal

Dr. Rajesh Verma, Assistant Professor
and Head, U.G. Department of
Zoology, D.K. College, Buxar (Bihar).
B.Sc. part 1st, paper 2 (A).

Question :- Ozone depletion full Notes like?

Answer :- Ozone depletion :-

Ozone depletion consists of two related events observed since the late 1970s: a steady lowering of about four percent in the total amount of ozone in Earth's atmosphere (the ozone layer), and a much larger springtime decrease in stratospheric ozone around Earth's polar regions. The latter phenomenon is referred to as the ozone hole. There are also springtime polar tropospheric ozone depletion events in addition to these stratospheric events.

Ozone cycle overview :-

Three forms (or allotropes) of oxygen are involved in the ozone-oxygen cycle: oxygen atom (O or atomic oxygen), oxygen gas (O_2 or diatomic oxygen), and ozone gas.

CO_2 or triatomic oxygen). Ozone is formed in the stratosphere when oxygen molecules photodissociate after absorbing ultraviolet photons. This converts a single O_2 into two atomic oxygen radicals. The atomic oxygen radicals then combine with separate O_2 molecules to create two O_3 molecules. These ozone molecules absorb ultraviolet (UV) light, following which ozone splits into a molecule of O_2 and an oxygen atom.



The total amount of ozone in the stratosphere is determined by a balance between photochemical production and recombination.

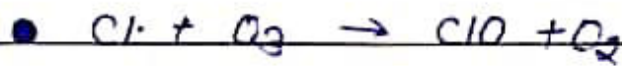
Ozone is a highly reactive molecule that easily reduces to the more stable oxygen form with the assistance of a catalyst. Cl and Br atoms destroy ozone molecules through a variety of catalytic cycles. In the simplest example of such a cycle, a chlorine

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atom reacts with an ozone molecule (O_3), taking an oxygen molecule (O_2).



A chlorine atom removes an oxygen atom from an ozone molecule to make a ClO molecule. (to make)



This ClO can also remove an oxygen atom from another ozone molecule; the chlorine is free to repeat this two step cycle.

The overall effect is a decrease in the amount of ozone, though the rate of these processes can be decreased by the effects of null cycles. More complicated mechanisms have also been discovered that lead to ozone destruction in the lower stratosphere.

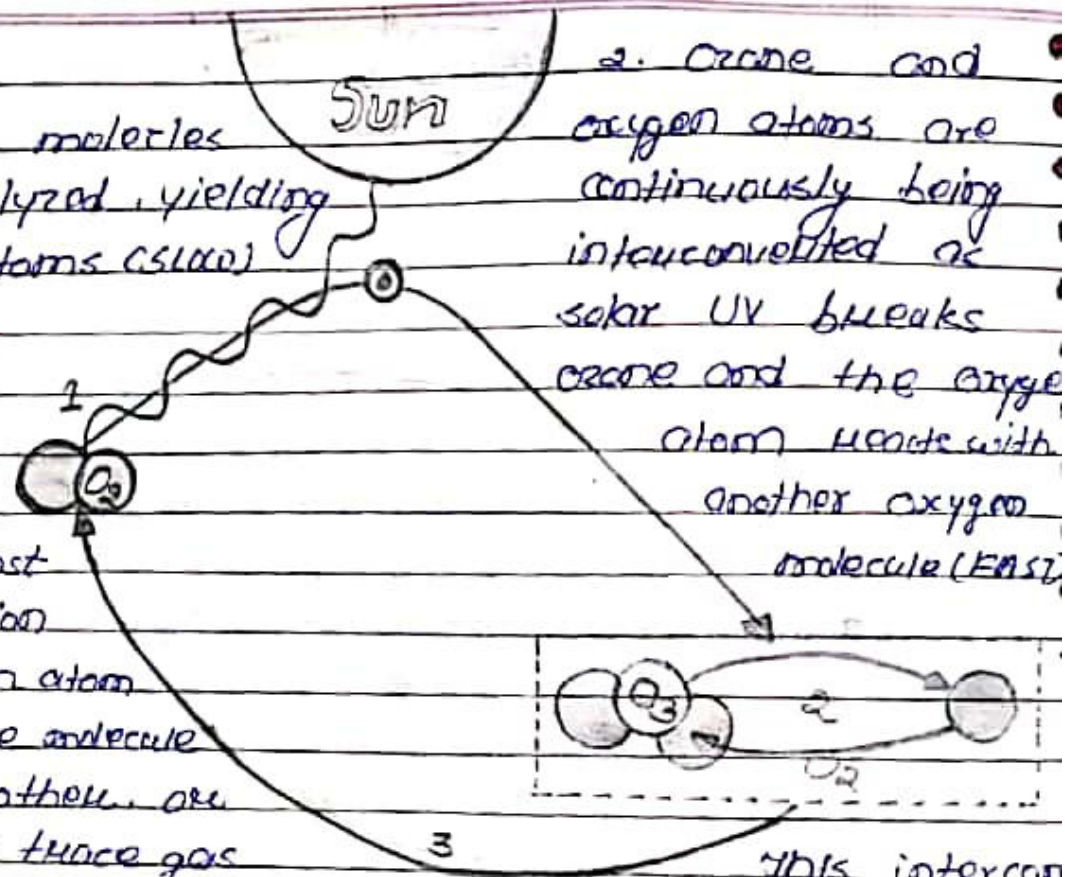
The Ozone Cycle :-

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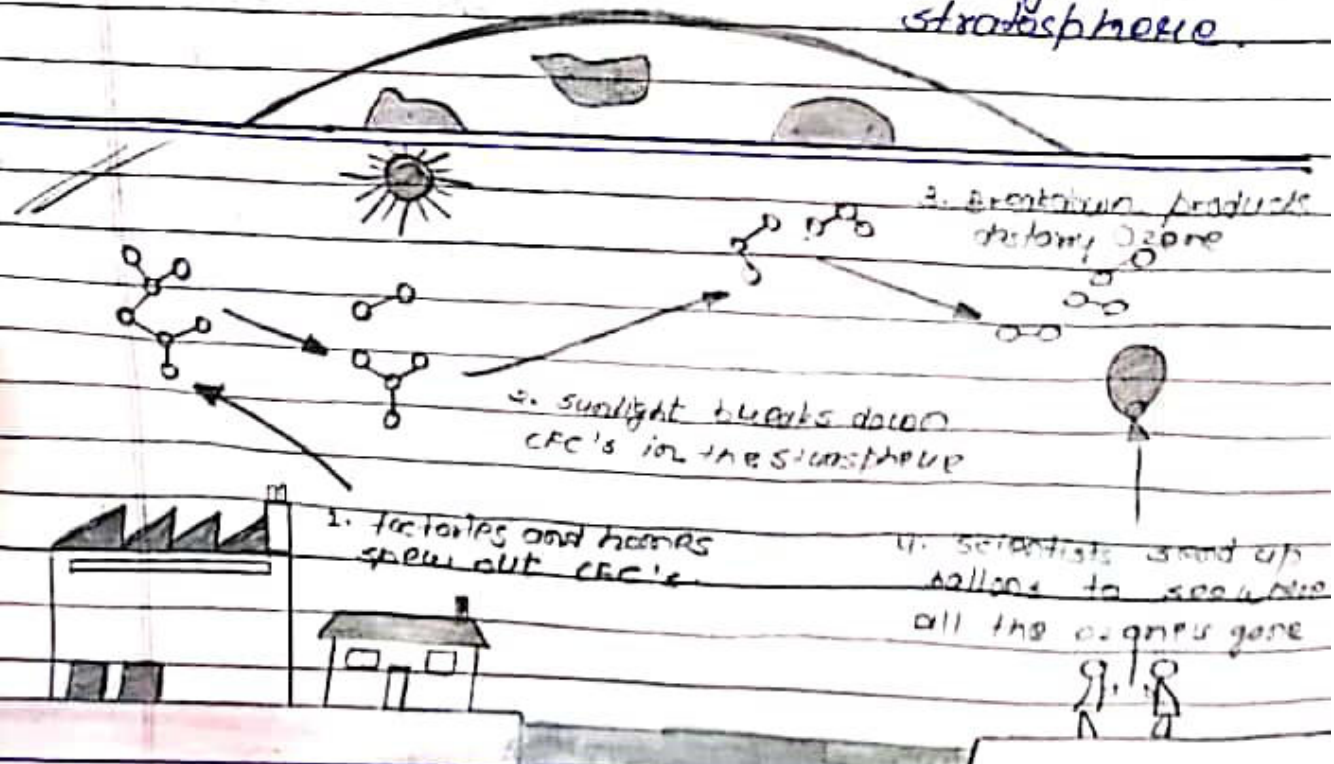
1. Oxygen molecules are photolyzed, yielding oxygen atoms (slow)

2. Ozone and oxygen atoms are continuously being interconverted as solar UV breaks ozone and the oxygen atom reacts with another oxygen molecule (Fast)

3. Ozone is lost by a reaction of the oxygen atom or the ozone molecule with each other, or some other trace gas such as chlorine (slow)



This interconversion process converts UV radiation into thermal energy heating the stratosphere.



1. factories and homes spew out CFC's

2. sunlight breaks down CFC's in the stratosphere

3. Breakdown products destroy ozone

4. scientists send up balloons to see where all the ozone goes