



WELCOME

TO OUR PRESENTATION

**CHEMICAL SHADOWS :
THE DARKER SIDES AND
CONSEQUENCES OF
CHEMISTRY ON OUR
ENVIRONMENT**



HISTORY OF

THALIDOMIDE

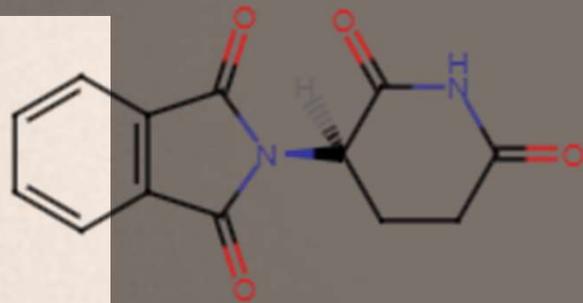
Thalidomide is nothing but a man making chemical disaster in Medical Side. It made a terrific history with a great damage was occurred in birth system at the end of the 20th century. In 1957, this drug was released 1st at German market. It was announced that this drug could be used for Pregnant women. They assumed it was harmless. Thalidomide was widely used drug in the late 1950s and early 1960s for the treatment of nausea in Pregnant women, although it (this drug) was not tested yet on any pregnant women. In 1960, thalidomide was available almost in 46 countries. Then, Dr. Widukind Lenz and Dr. William McBride could detect that it easily penetrated the Fetus and caused for birth defects. Thalidomide was banned in most of the countries at that time. After 60 years, thalidomide revisits the history of medicine. But, now it is used for the treatment of leprosy and later multiple myeloma. In many parts of the world that lack extensive medical surveillance initiatives. Thalidomide treatment of pregnant women with leprosy has contained to cause malformations. The thalidomide tragedy marked a turning point in toxicity testing, as it prompted United States and international regulatory agencies to develop systematic toxicity testing protocols. Then, thalidomide was used only as an oral pill (👉)



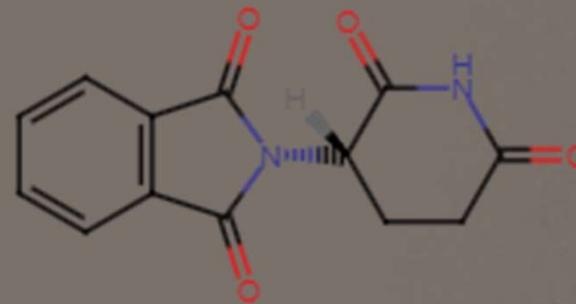
WHAT IS

THALIDOMIDE

Thalidomide is a sedative as well as tranquilizer drug. It has two configurations 'R' and 'S'. R-configuration acts as sedative drug and 'S'-configuration acts as sedative drug tranquilizer drug.

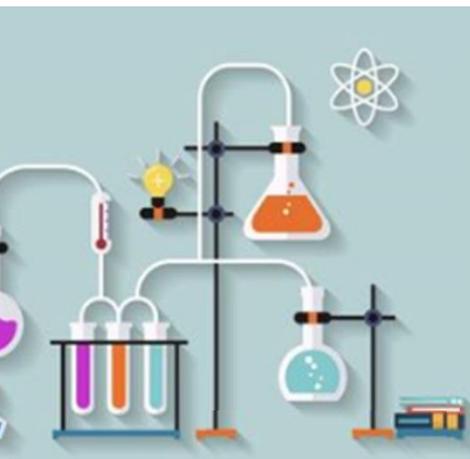


R-(+) -
thalidomide

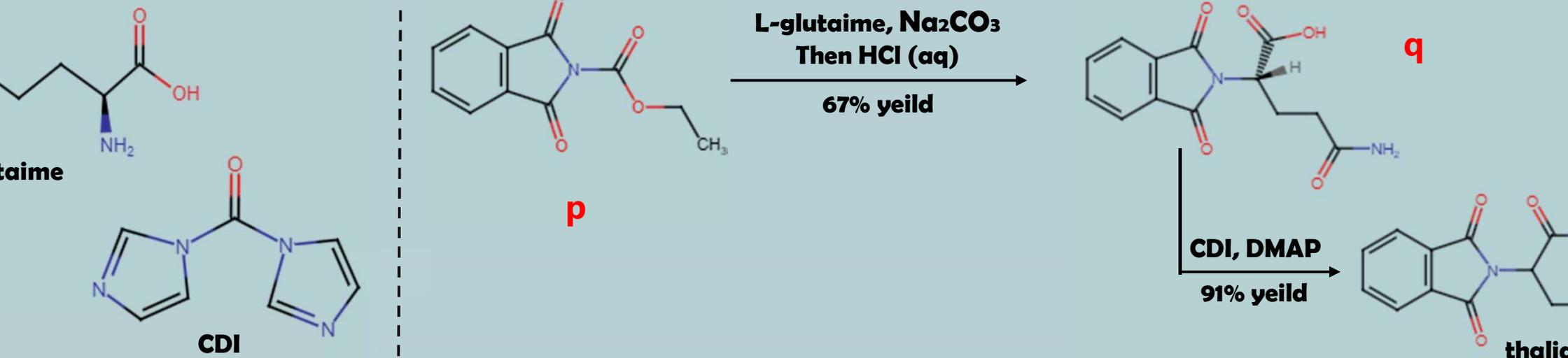
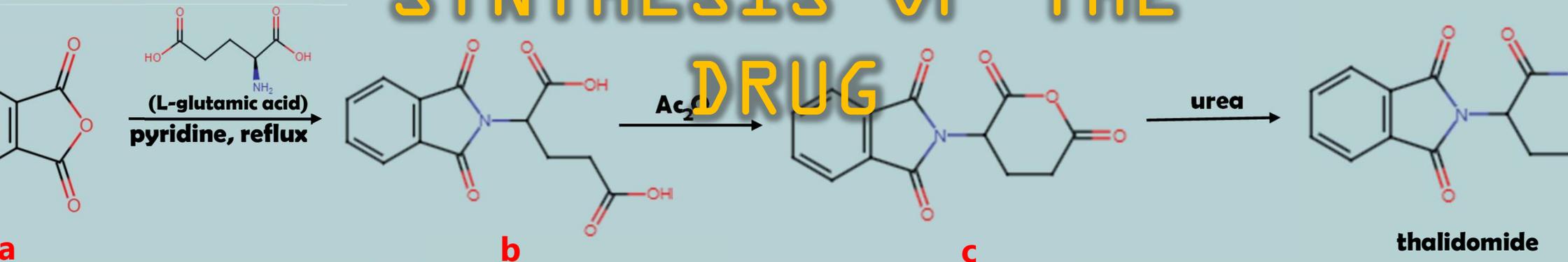


S-(-) -
thalidomide

'R'-configuration of Thalidomide is caused for **Brith Deffect** and 'S'-configuration of Thalidomide is used in oncology (cancer treatment). It's half life span is hours. It is not hereditary that means it has not been Passed on to future generation.



STRUCTURE & SYNTHESIS OF THE DRUG



Drawbacks and Consequences

When thalidomide was used in Pregnancy; there were so many defects on newly born baby. Like :-

-) Phocomelia
-) Disfigurements of the ear
-) Ocular abnormalities.
-) Facial palsies
-) Internal organ damage

o on.

ow; it works in the field of Cancer. But there are also some side-effects.

ke :-

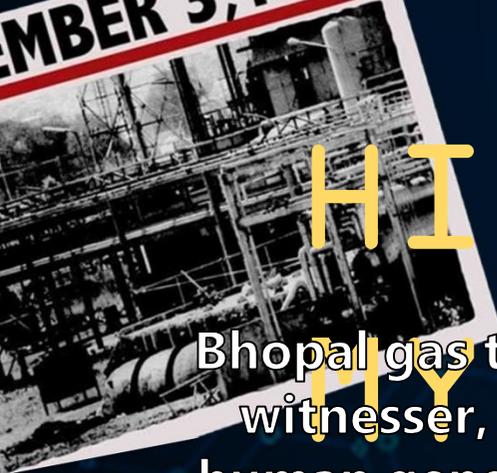
-) skin rash
-) Constipation
-) Dry skin
-) Fast heartbeat
-) Loss of taste , dry mouth

) Dizziness

o on,



DECEMBER 3, 1984

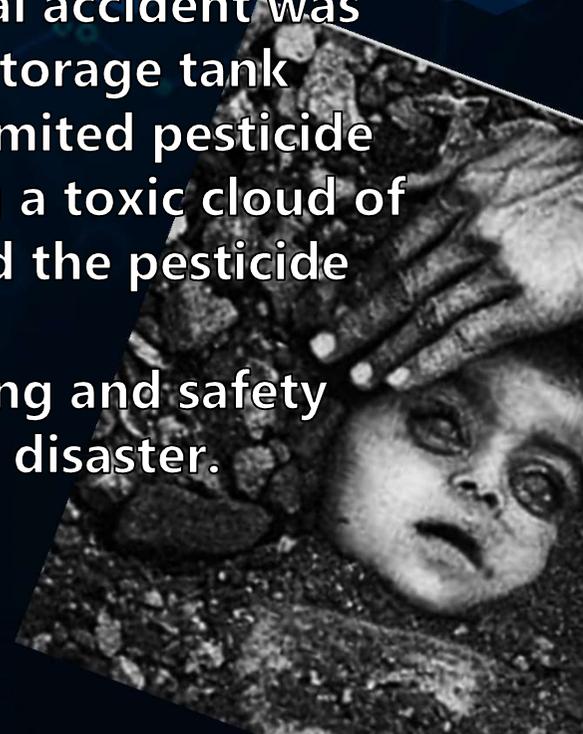


HISTORY OF THE

HISTORY

Bhopal gas tragedy a blackish dark night about which the history is still an witnesser, in the industry of applied chemistry. Disaster, any natural or human generated calamitous event that produces great loss of human life or destruction of the natural environment/ public infrastructure. It was occurred on the night of december 2-3,1984.This chemical accident was happend due to a highly toxic chemical ,mic. When a storage tank containing about 45 tons mic at the union carbide india limited pesticide plant in Bhopal , madhya Pradesh , india , Leaked, releasing a toxic cloud of gas over the city where over 500,000 people were around the pesticide plant .

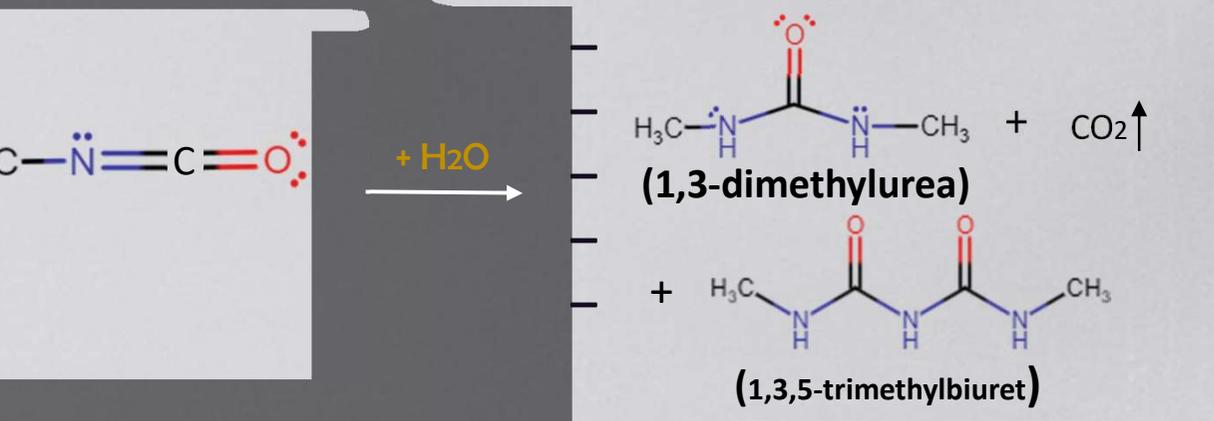
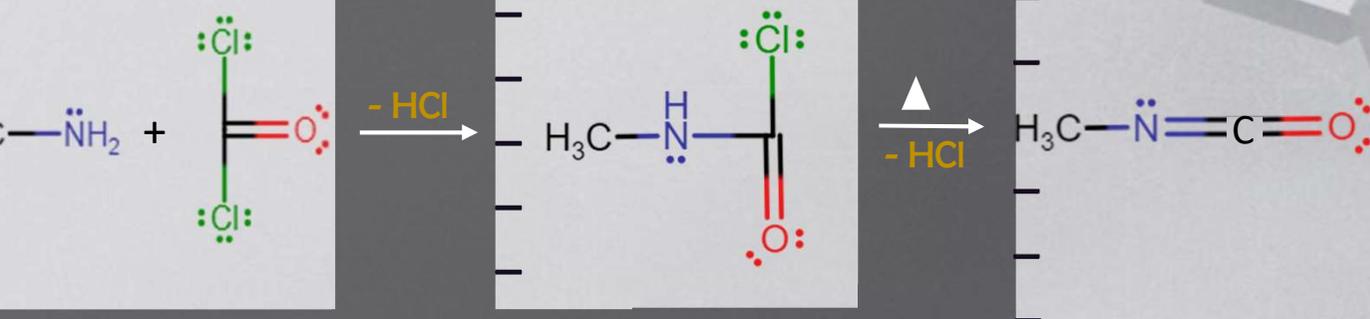
Investigation later established that substandard operating and safety procedures at the under staffed plant has led to the disaster.



ALL ABOUT



A deadly Poisonous organic compound. It is very active, highly flammable at a temperature below 39°C (102°F), Colourless liquid. After exposing to air, it readily evaporates. It is ~1.4 times heavier than air in gaseous form. Methylisocyanate (MIC) is produced industrially by reacting methylamine (CH₃NH₂) with phosgene (COCl₂)





FAULTS & CONCLUSION

Faults: There are two main lines of argument involving this disaster.

1. The corporate's negligence.

2. Adequacy of equipment and regulations.

Conclusions: A terrible coloring was observed after this disaster. Estimates vary on the death toll, with the official no. of immediate deaths being 2259. In 2008, the government of Madhya Pradesh paid compensation to the family members of 3 victims killed in the gas tragedy and 574366 injured victims. Others estimate that 8000 died within two weeks and another 8000 or more have since died from gas-related disaster.

Chemical has better as well as worst sides. Here we see a deathly incident due to negligence about chemical through Bhopal gas tragedy. So, in the time of working with chemical we should be too careful about that.



Introduced with ozone layer

The ozone layer is mainly found in the lower portion of the earth's atmosphere, that is stratosphere. It has the potential to absorb around 97-99% of the harmful ultraviolet radiation coming from the sun. It contains a high concentration of ozone (O_3), in relation to other parts of the atmosphere, although still small in relation to other gases in the stratosphere. The Dobson unit is a way to describe how much ozone there would be in the column if it were squeezed in a single Layer .



But day by day, the ozone layer depletion becomes a very bright issue in wild as well as animal world.

ozone Depletion : ozone layer depletion is the gradual thinning of the earth's ozone layer in the upper atmosphere caused due to the release of chemical Compounds containing gaseous Bromine(Br) or Chlorine (Cl) from industries or other human activities .

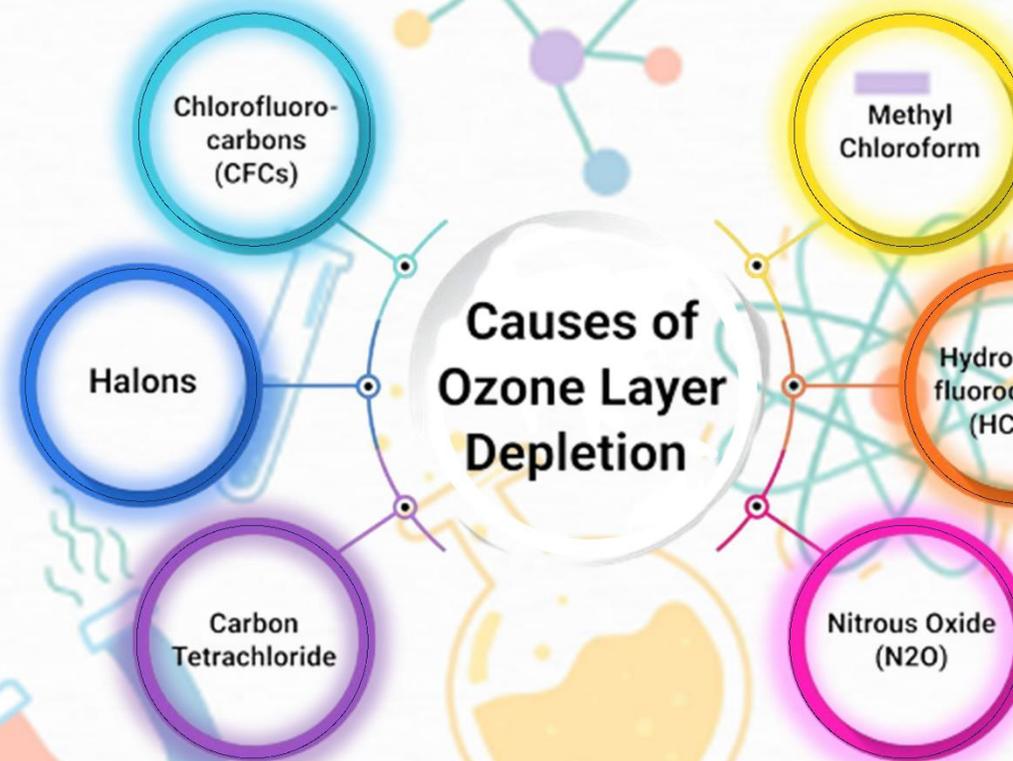
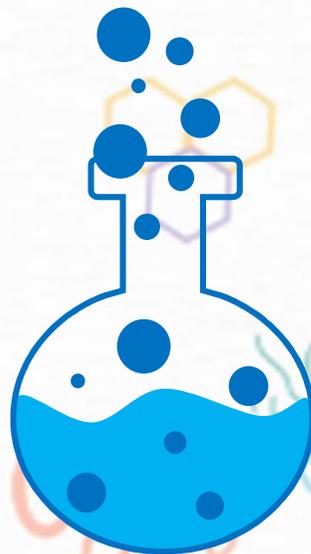
The mystery behind ozone Depletion

It happens when the chlorine and Bromine atoms in the atmosphere come in contact with ozone and they destroy ozone molecules. One chlorine can destroy 100,000 molecules of ozone. It's destroyed more quickly than it is created.

There are some compounds that release chlorine and Bromine on exposure to high ultraviolet light which then contributes to ozone layer depletion. Such compounds are known as Ozone Depleting substance (ODS).

Example :

- 1) Chlorofluorocarbons (CFCs)
- 2) Hydrochlorofluorocarbons (HCFCs)
- 3) Methyl bromide (CH_3Br)
- 4) Carbon tetrachloride (CCl_4)
- 5) Hydrobromofluorocarbon (CH_2BrF)
- 6) Chlorobromomethane (CBrCl_2)
- 7) Methyl chloroform (CH_2Cl_2)
- 8) Halons .
- 9) N_2O , etc.....



CFC

HALON

CH_3Br

N_2O

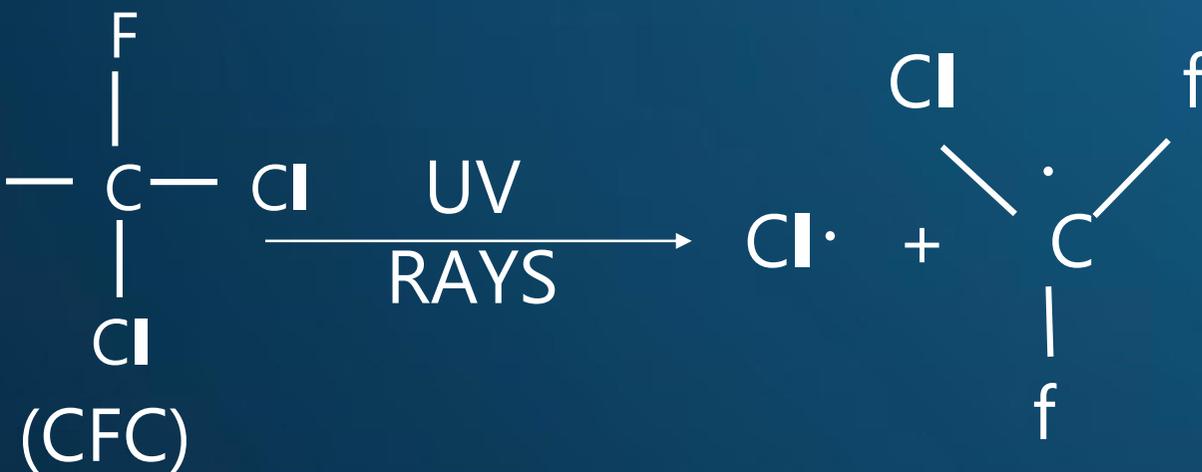
CFC :- The most harmful substance which is mainly the cause for ozone depletion .

Source :- the sources of CFC are refrEgerators, air conditioners, solvents, dry-cleaning agents, etc.

Work process :- when CFC drifts upwards towards the stratosphere, they come in contact with the Ozone layer. This leads to a chemical reaction, where the CFC molecules are broken up by UV Rays, releasing Cl radicals which are able to destroy ozone .

Reaction :-

Initiation :-



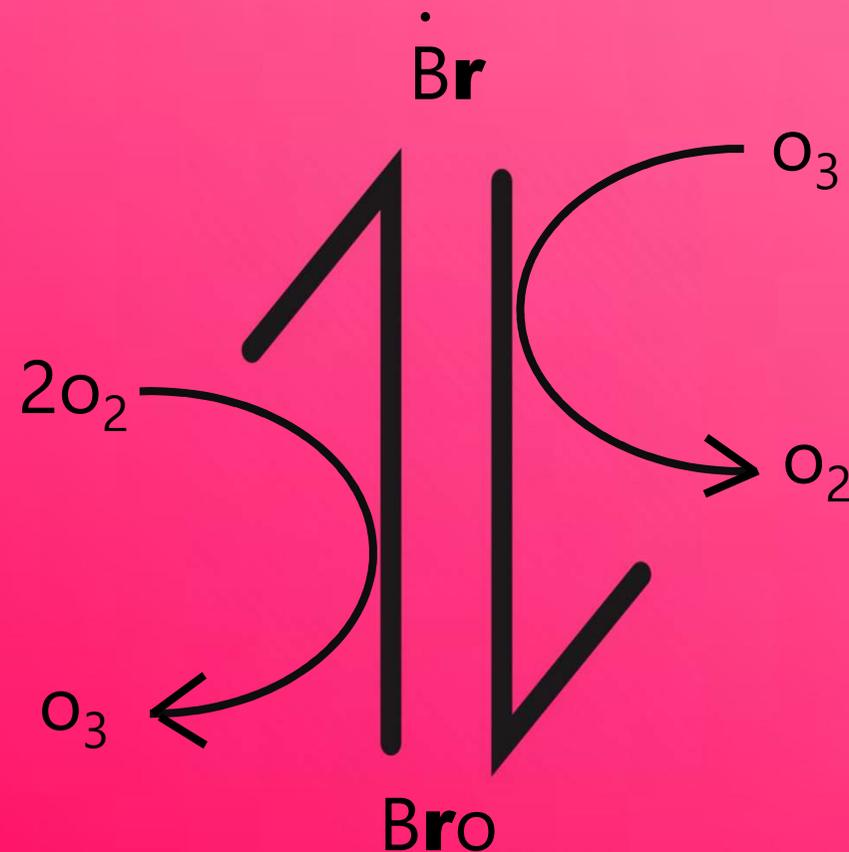
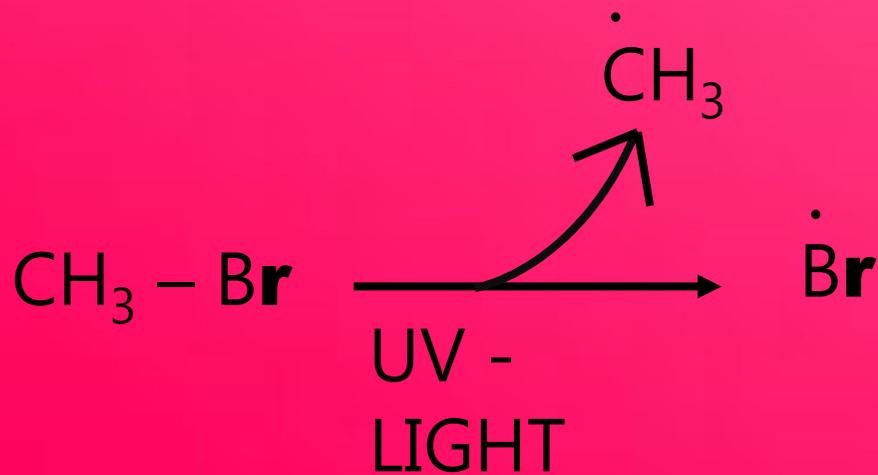
PROPAGATION



CH₃Br- BROMINE is 40-100 times more REACTIVE THAN chlorine

Source :- OCEANS, BIOMASS, BURNING & FUMIGATION.

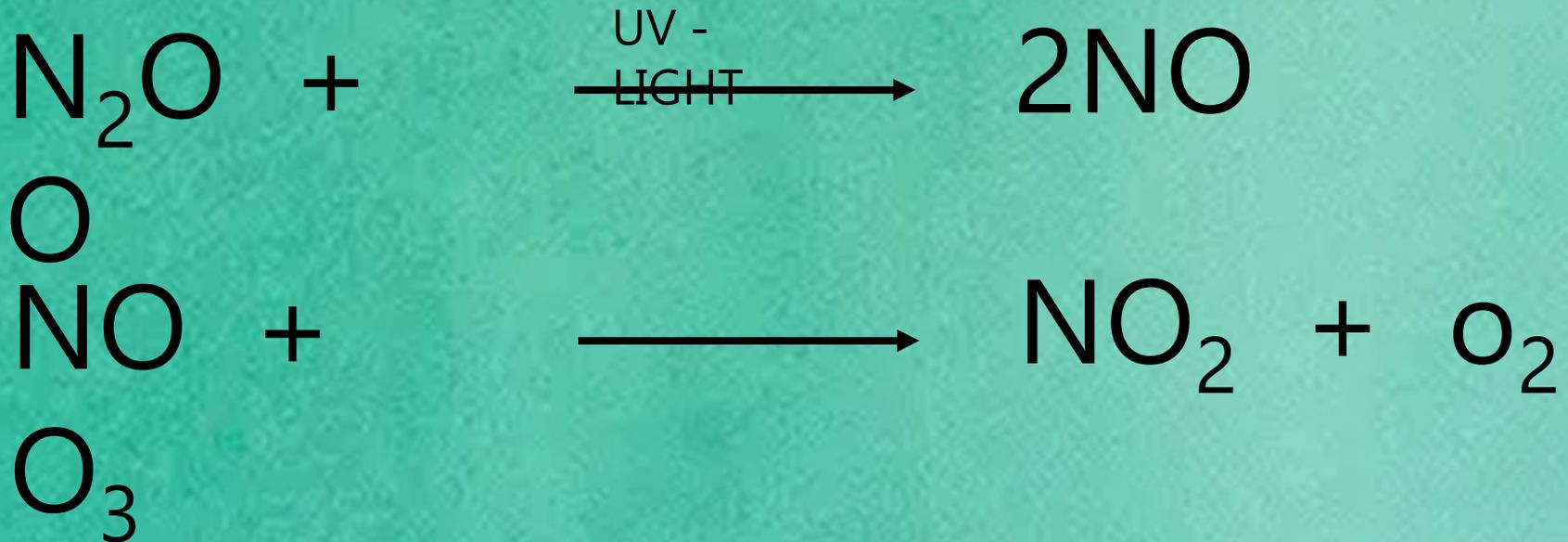
Reaction:-



O:- n2o is now the largest ozone-destroying gas emitted by man activities based on odp-weighted emissions.

urce :- ROAD TRANSPORT, OTHER FUEL, COMBUSTION SOURCES AND WASTE PROCESS .

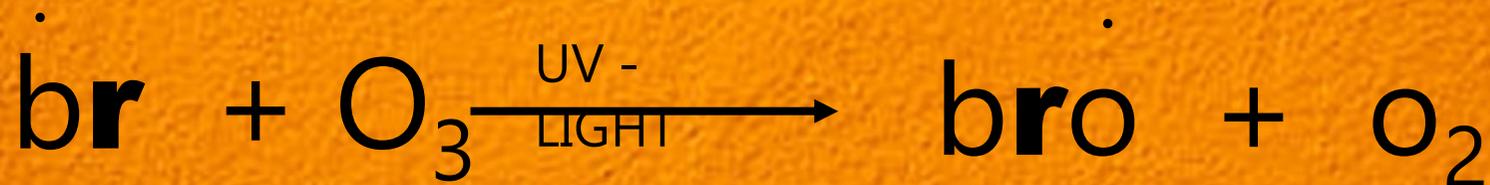
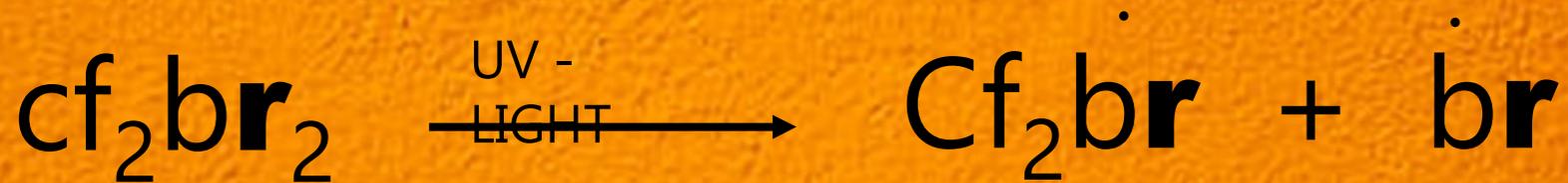
action :-



loNs:- All halons contain bromine which is 40-100 times more effective at destroying ozone than chlorine.

Source :- Fire extinguishers.

Reaction:-



The fate of ozone

A great loss has happened due to ozone depletion and that is ozone hole. It's not a technically a hole, but it is the space where no ozone is present.

It is actually a region of exceptionally depleted ozone in the stratosphere over the Antarctic that happens at the beginning of South Hemisphere spring (August-October). Ozone hole is detected 1st by a group of scientists (J.c.Farman, B.G.Gardiner and J.D. Shanklin).

The effect on world :-

Strong UV rays may lead to minimal growth, flowering and Photosynthesis in plants. The forests also have to bear the harmful effects of the UV Ray.

Planktons are greatly affected by the exposure to harmful UV Rays. These are high in the aquatic food chain. If the plankton are destroyed, the other organisms in the food chain are also affected.

The effect on animals and Human life :-

Direct exposure to UV radiation leads to skin and eye cancer in animals.

In human life it affects such as skin diseases, cancer and so on....



How can we save the upper layer of the earth

There are so many ways to stop this life-destruction depletion. Like :-

- (i) Minimize the use of vehicles.
- (ii) Use Eco-friendly cleaning Pds.
- (iii) use of Nitrous oxide should be prohibited.
- (iv) Pesticides should not be used
- (v) reuse and recycle
- (vi) Minimize the use of refrigerator, Fridge, Ac and so on.

So, we all should have a healthy & eco-friendly environment. That's why, we should clean the environment as well as this whole world and aware all the people around us.