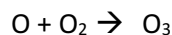


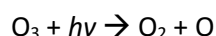
Teacher Background Information Sheet

The chemistry of Ozone

Ozone is produced in the upper stratosphere where UV radiation from the sun dissociates (splits) molecular oxygen to form atomic oxygen.



The ozone is destroyed when it constantly absorbs UV light that would otherwise reach the Earth's surface.



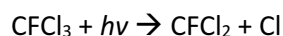
There is no net ozone depletion because the process produced atomic oxygen that reacts with molecular oxygen to produce another ozone molecule.

Ozone is continually being destroyed through reactions with naturally occurring radicals (free atoms) of chlorine, nitrogen, hydrogen or oxygen. The ozone hole problem started to occur when the concentration of chlorine radicals in the stratosphere started to increase as a result of man-made products. The natural cycle of ozone production and destruction was put out of balance, leading to an overall ozone deficit.

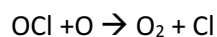
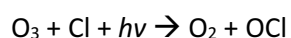
Chlorofluorocarbons – CFCs

CFCs at ground level are very stable, unreactive molecules but in the upper stratosphere they react with UV radiation from the sun.

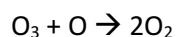
First the CFCs break down to form chlorine (Cl) radicals



The chlorine reacts with ozone in a chain reaction



The overall effect is



Sometimes the Cl will react with other chemicals in the atmosphere, but sooner or later the Cl will react with more ozone. There are lots of different types of CFC molecules. Once in the upper stratosphere they all behave in the same way.

Seasonal changes mean that at certain times of the year, the ozone layer is thinner than at others.