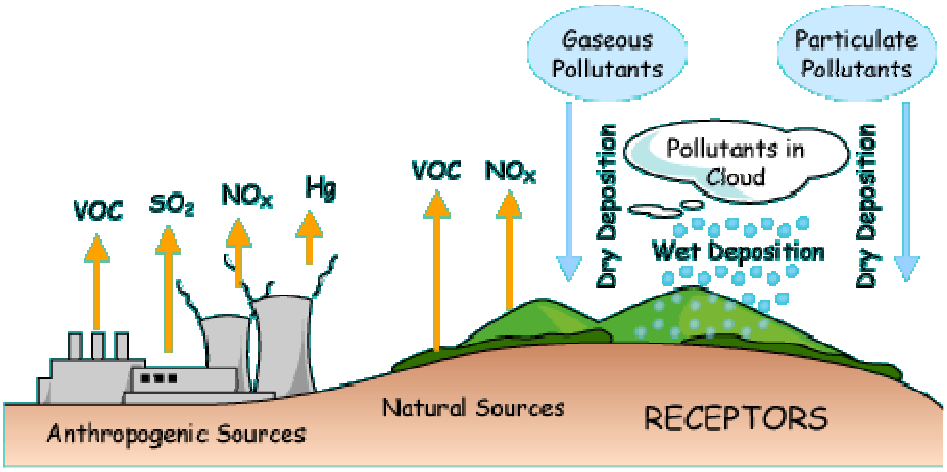
Chemistry project

Air pollution

Name: Lee Wai Ho

Class: 6S

Class No.: 20



Major type of air pollutant and their sources

1) **Carbon monoxide**: it is a common pollutant that produce by incomplete combustion, mainly come from motor car exhausted gas
2) **Sulphur dioxide**: this pollutant usually produce by burning of sulphur containing compound, such as metal ore and fossil fuels
3) **Nitrogen oxide**: high temperature reached during the burning of fuels inside the car engine cause the oxidation of nitrogen. Nitrogen oxide is formed
4) **Hydrocarbon**: some car exhausted gas contain unburnt hydrocarbon
5) **Ozone**: produce by the reaction of oxygen gas with three free atoms of oxygen
6) **Respiratory suspended particulates**: incomplete burning of hydrocarbon produce dark smoke containing carbon particles

LINK:

http://www.gsfc.nasa.gov/gsfc/earth/terra/co.htm

This web is made by nasa and mainly state about the global air pollution

http://www.epa.gov/air/urbanair/ginfo.html

The details of the six common air pollutants and their effect on human

http://www.epd.gov.hk/epd/english/environmentinhk/air/air_maincontent.html

This web site of HK government environment protection department, give an overview on air quality and air pollutant control in HK

http://www.ust.hk/%7Ewebpepa/pepa/lecture%5Fnotes/Pollutions/air.htm

It state out 5 major type of pollutant and their sources

Effect of air pollution on human and environment

1) Effect on human: some air pollutant such as CO, SO_2, NO_x are acidic gas which would stimulate the respiratory system, some hydrocarbon may cause cancer, the suspended particulates may enter the lung and cause lung disease

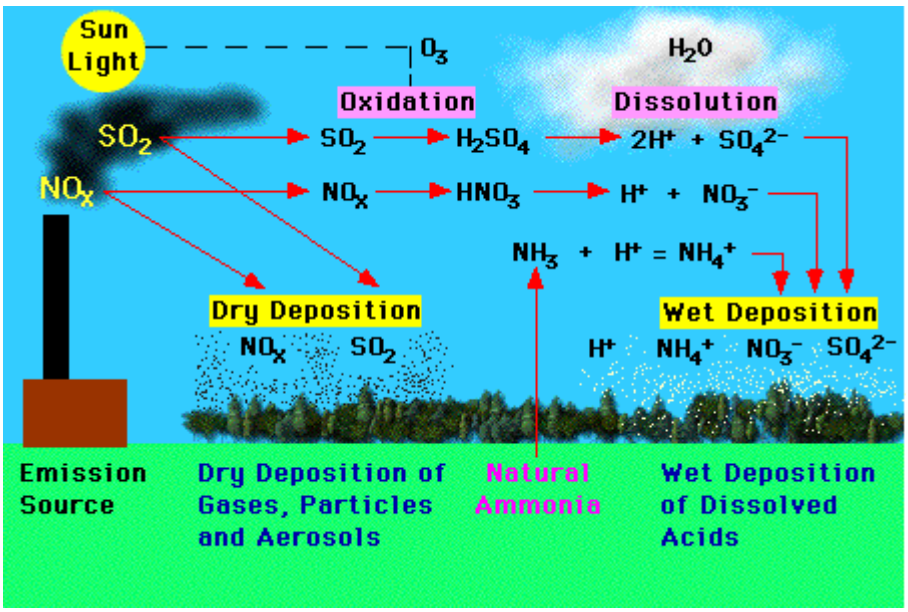
2) Effect on environment:

   a) Acid rain: the acidic pollution gas would combine with rain water to form acid rain

$$CO_{2(g)} + H_2O_{(l)} \longrightarrow H_2CO_{3(aq)}$$

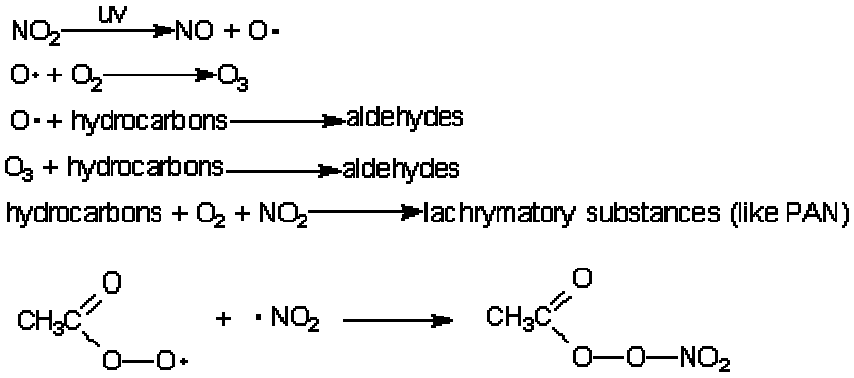
$$SO_{2(g)} + H_2O_{(l)} \longrightarrow H_2SO_{3(aq)}$$

$$NO_{2(g)} + H_2O_{(l)} \longrightarrow HNO_{3(aq)} + HNO_{2(aq)}$$



Acid rain will damage to forests, metalwork and building materials. And acid rain also harm to water lives.

b) Photochemical smog: Photochemical smog is a mixture of particulates, nitrogen oxides, ozone, unburnt hydrocarbons, etc.



The photochemical will cause headaches, irritation of eyes, nose inflammation of the lungs , damage plants ,etc.

LINK:

http://www.doc.mmu.ac.uk/aric/eae/english.html

this web contain information and the effect of acid rain

http://syi.hkcampus.net/~syi-kc/acid_start.htm

http://hk.geocities.com/environment2001hk/rain.htm

the above two web are two Chinese web site state the information of acid rain

http://www.sunnway.com.tw/epa/oilgas%5Frecycle/c2%2D1.htm#smog

some information about smog

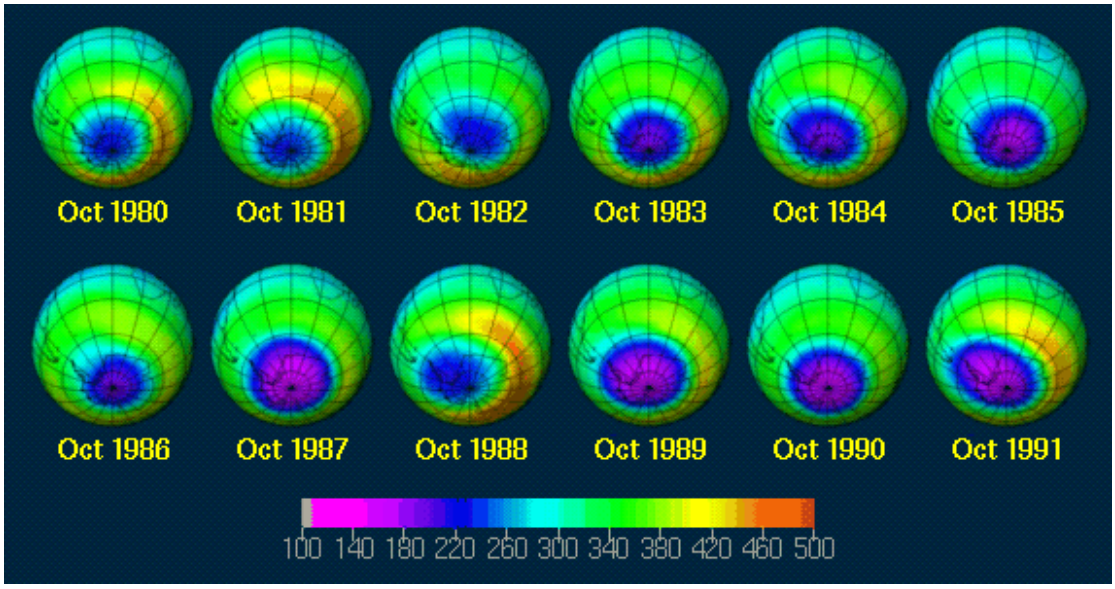
http://resources.ed.gov.hk/envir%2Ded/text/hkissue/e%5Fm1%5F1%5F3.htm

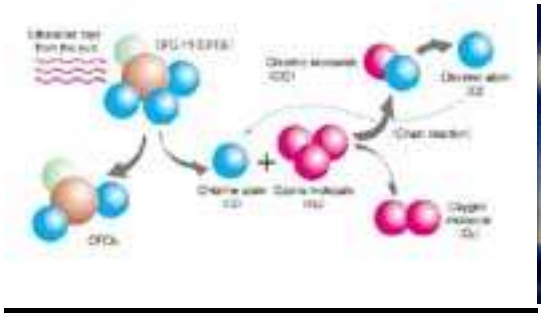
it state that how smog is produce and the effect on environment

Ozone layer and chlorofluorocarbon(CFCs)

The Ozone Layer:

The ozone layer is made up from ozone gas. The ozone layer serves as a vital and effective protective barrier from the sun's ultraviolet rays.





Chlorofluorocarbon(CFCs):

Chlorofluorocarbons (CFCs) are the compounds which containing chlorine, fluorine and carbon. It is a unreactive low flammability and low toxicity. It usually use as coolants in refrigeration systems and air conditioners

The present of CFCs make the depletion of ozone

The chlorine formed by the seperated of CFCs responsible for the damage caused to the ozone layer.

$$CCl_3F(g) \xrightarrow{\text{uv light}} CCl_2F\ (g) + Cl\ (g)$$

$$CCl_2F_2(g) \xrightarrow{\text{uv light}} CClF_2\ (g) + Cl\ (g)$$

The Cl from the above initiation steps readily depletes ozone via a sequence of the following equations:

$$Cl\ (g) + O_3 \rightarrow ClO\ (g) + O_2(g)$$

$$ClO\ (g) + O(g) \rightarrow Cl\ (g) + \underline{O_2(g)}$$

$$\text{Overall reaction: } O_3(g) + O_2(g) \rightarrow 2O_2(g)$$

LINK:

http://www.virtualglobe.org/en/info/env/02/ozone01.html

this web describe what is ozone and the depletion of ozone layer

http://content.edu.tw/primary/society/tc_sm/teach/book12/lesson251.htm

http://content.edu.tw/senior/chemistry/tp_sc/surround/ozone/right13.htm

the above two web is Chinese web site which show us how depletion of ozone occur and the effect of it

http://www.cmdl.noaa.gov/noah/publictn/elkins/cfcs.html

this web show us what is CFCs

http://www.renewingindia.org/cliozone.html

it show us how CFCs destroy ozone layer

http://www.pca.state.mn.us/air/cfc.html

it show the bad effect of CFCs on enviroment