Environmental Chemistry

Environmental chemistry

- is the **scientific study** of the chemical and biochemical phenomena that occur in natural places.

Environmental chemistry

- It can be defined as the study of the:

  - Sources
  - Reactions
  - Transport
  - Effects
  - Fates

  } of chemical species

  in the **air**, **soil**, and **water** environments;

  and the effect of **human** activity and biological activity on these.

Environmental chemistry

is an **interdisciplinary** science that includes:

- Atmospheric chemistry
- Aquatic chemistry
- Soil chemistry

as well as heavily relying on **Analytical chemistry** and being related to environmental and other areas of science.

Environmental chemistry

Important general concepts from **chemistry** include understanding:

- **chemical reactions**
- **equations**
- **solutions**
- **units**
- **sampling**
- **analytical techniques**

Environmental chemistry

contaminant

A contaminant is a substance present in nature at a level higher than typical levels or that would not otherwise be there.

pollutant

which is a substance that has a detrimental impact on the surrounding environment.

Environmental chemistry

Receptor

The "medium" (e.g. soil) or "organism" (e.g. fish) affected by the pollutant or contaminant is called a ***receptor***.

Environmental chemistry

Environmental indicators

Chemical measures of medium quality include:

- **dissolved oxygen (DO)**
- **chemical oxygen demand (COD)**
- **biochemical oxygen demand (BOD)**
- **total dissolved solids (TDS)**
- **pH**
- **nutrients (nitrates and phosphorus)**
- **heavy metals**
- **pesticides**

Homework

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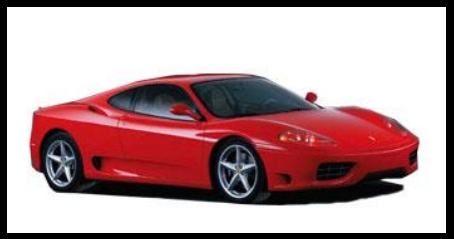
Acid Rain

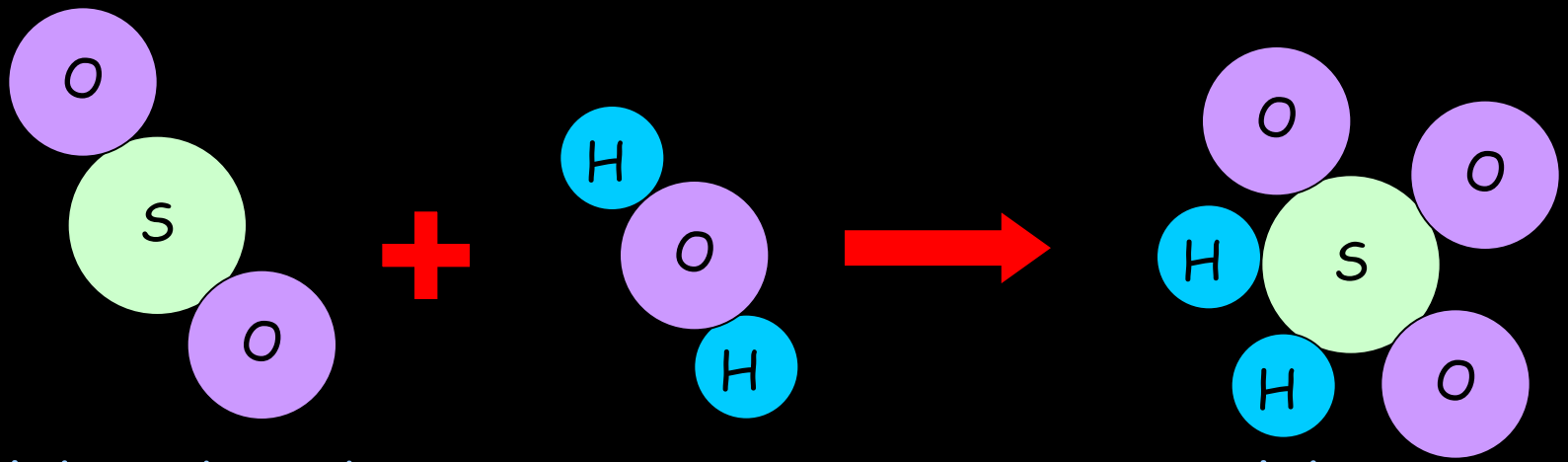
Acid rain damages trees and buildings and can harm wildlife. What causes it?

Carbon dioxide and sulphur dioxide from power stations

Sulphur dioxide from volcanoes

Oxides of nitrogen

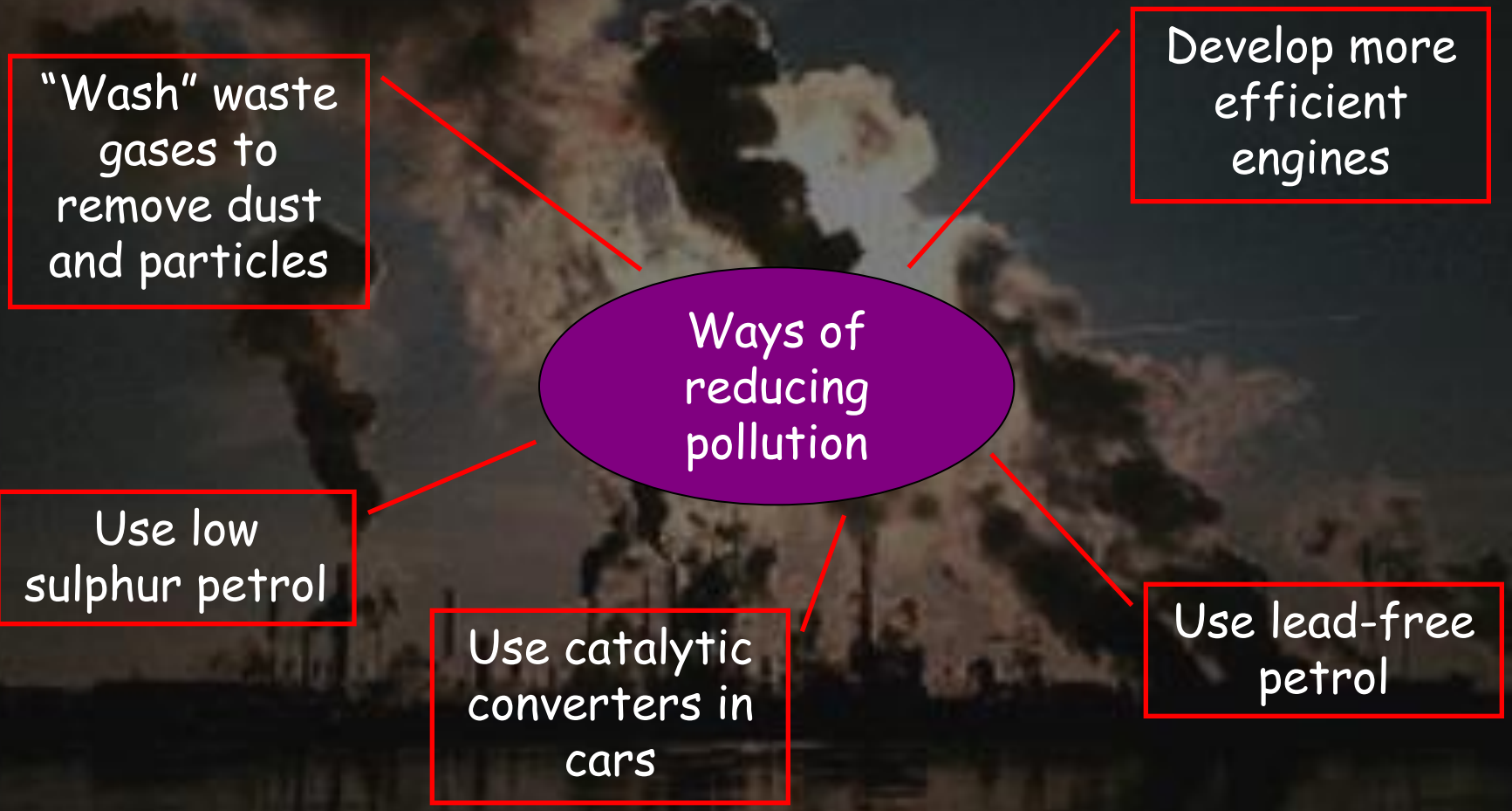




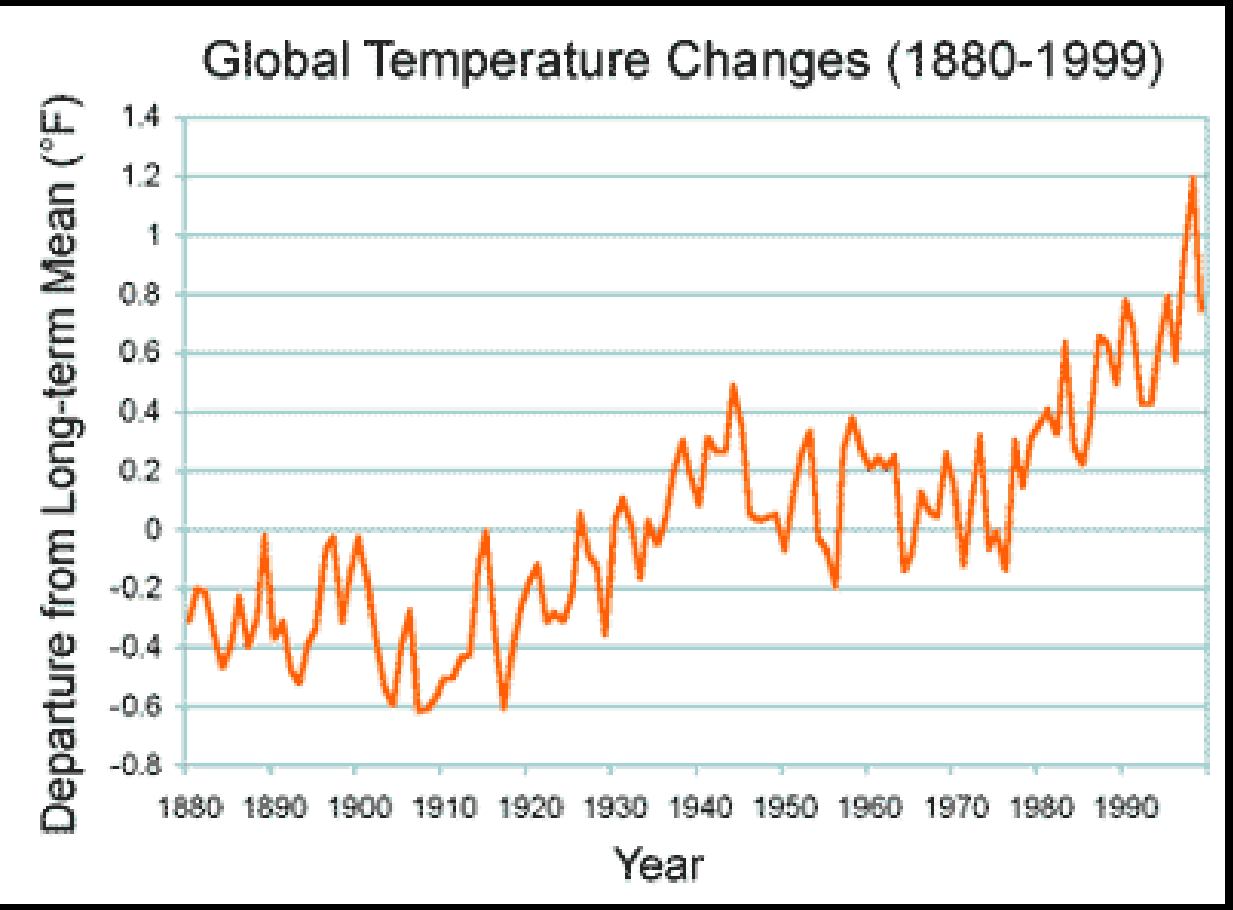
Sulphur dioxide + water ⟶ sulphurous acid

Air pollution

As well as acid rain, air can be polluted by dust, pollen, compounds of lead and carbon monoxide. Nearly all of this pollution is man made, so how can we stop it?



Global Warming

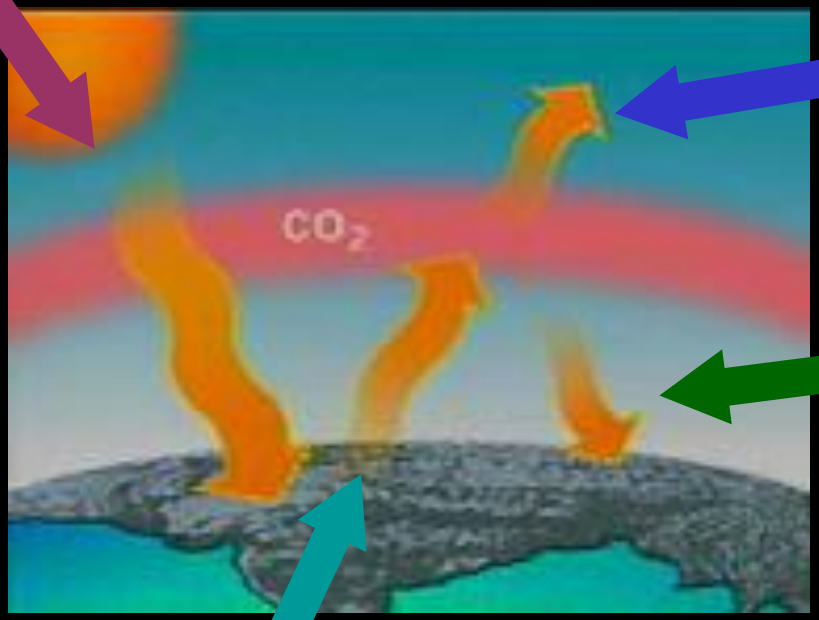


Facts:

1) The 10 warmest years of the last century have all occurred within the last 15 years
2) Sea level has risen by between 12 and 24cm in the last 100 years
3) Rainfall has risen by 1%

The Greenhouse Effect

1) Heat and light energy reach us from the sun…



3) …some of the heat escapes back into space…

4) …while some of it is reflected back to the Earth – this is called The Greenhouse Effect

2) …a lot of this heat is reflected off the Earth's surface…

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