

# Acid Rain

## What is it?

Acid rain is a term which you may have heard, but not quite understood. It certainly sounds very nasty doesn't it? But, unlike in cartoons, acid rain does not burn through everything that it touches! It does cause a lot of damage to buildings, plants, animals, and even humans, however. It is also a bit misleading, because even pure rainwater is slightly acidic. 'Acid rain' just means that the rain is more acidic than it should be. Before we look at what damage acid rain actually does, it is best to look at why it happens.

## How acid rain is formed

The main elements which are responsible for acid rain, are sulphur and nitrogen (in gas form). Both of these can be caused by a number of things, including some human activities, but they are also made naturally.

Human activities which produce sulphur dioxide and nitrous oxides include burning fossil fuels (like coal, and crude oil). Two things that are highly responsible for causing acid rain are power stations and factories. Although these are essential to human life in this day and age, they make large amounts of sulphur dioxide and nitrous oxides. In fact, power stations produce 70% of all of the chemicals which are responsible for acid rain.

Vehicles also play a large part in making sulphur dioxide and nitrous oxide, because petrol and diesel are produced from crude oil. So every time someone uses a car or a bus, they are increasing the amount of acid rain. The effect of one car or bus on acid rain is very small, but you think how many cars and buses are used by people every day, and imagine how much sulphur dioxide and nitrous oxides (the gas forms of sulphur and nitrogen) is made!

The acid rain problem is also added to by natural causes, such as volcano eruptions, lightning and bacterial action in soils.

## Its effects: human health

The main effect that acid rain has on humans is increasing breathing problems. The sulphur dioxide and nitrous oxides that are responsible for acid rain increase breathing problems such as asthma and coughs. They can also cause headaches and inflammation (swelling and redness) of the eyes, nose and throat.

Another problem which is caused by acid rain is that some poisonous (toxic) metals which are dissolved into the rain water can be absorbed by fruit, vegetables and sometimes even through the skin of animals. Although this may not affect the animal very much, it is a problem for us when we eat them. Chemicals such as mercury which collect in the organs of animals can be very nasty if taken into the body, because mercury has been linked to brain damage in children, as well as nervous disorders and even death. Also another metal, aluminium, which can be found in the bodies of

animals, has been linked to kidney problems and recently it has been suggested that it may lead to an illness called Alzheimer's.

### **Its effects: trees and soil**

One of the most serious impacts of acid rain is on forests and soils. A lot of harm is caused when sulphuric acid falls to the earth as rain. Nutrients in the soil, which plants and animals need to survive, are washed away. Not all of the sulphur dioxide is turned into sulphuric acid, and in fact, lots of it can float in the atmosphere, move over to another area, and return to the soils, still as sulphur dioxide. This gas can then clog up the leaves of the plants, and stop them from making their own food using sunlight (photosynthesising).

### **Its effects: buildings & other structures**

Acid rain causes millions of pounds worth of damage to buildings and structures around the country each year. The effects that the rain has on structures depends greatly on its acidity (how powerful the acid is). Acid rain wears rock structures down gradually, and can be devastating over long time periods, causing bridges to collapse or become unstable, and also eats away at statues and houses.

## **QUESTIONS**

- 1) What is acid rain?**
- 2) Why is 'acid rain' a misleading term?**
- 3) What two elements are responsible for acid rain?**
- 4) What things that humans do cause acid rain?**
- 5) What effects does acid rain have on humans?**
- 6) What effects does acid rain have on trees and plants?**
- 7) What effects does acid rain have on buildings and structures?**