

Carbon Monoxide

- ❖ State the adverse effect of Carbon Monoxide on health and discuss why this pollutant is of global concern.
- ❖ Explain why carbon monoxide detectors are used.

What does the hazard card tell you?

What do we need to watch out for in the lab?

When natural gas or other hydrocarbon fuels are burned, the products are normally carbon dioxide (CO₂) and water. However, if gas fires or heaters do not get enough oxygen, carbon monoxide (CO), soot (carbon) and water can be produced instead. This can happen if the heater is not installed or maintained properly. Carbon monoxide is a poisonous gas, and kills around 30 people every year in the UK. It is particularly dangerous because you cannot see it, smell it or taste it.

All the cells in your body need oxygen. It is carried in the blood by a substance called haemoglobin (pronounced '*hee-mo-glow-bin*'), which is found in the red blood cells. If you breathe in carbon monoxide it combines with the haemoglobin to form a compound called carboxyhaemoglobin.

Carboxyhaemoglobin cannot carry oxygen around your body. The more carbon monoxide you breathe, the less oxygen can get around your body, and eventually you suffocate. Once carbon monoxide has combined with haemoglobin, it takes a long time for the chemical to return to normal. After you stop breathing in carbon monoxide, it will take 5 hours for the amount of carboxyhaemoglobin to halve.

The symptoms of carbon monoxide poisoning are headaches, fatigue, nausea and dizziness, which get worse as you breathe more of the gas. If you are exposed to the gas for a long time (or too high concentrations of the gas) you could lose consciousness and die.

- 1 Write word and symbol equations to show what happens when methane (CH₄) burns:
 - a in plenty of air
 - b when there isn't enough air.
- 2 How can you tell from the formulae that carbon dioxide and carbon monoxide probably have different properties?
- 3 What might you see above a heater producing carbon monoxide? (*Hint: Look at the other products of the reaction.*)
- 4 What are the symptoms of carbon monoxide poisoning?
- 5 Explain why carbon monoxide is poisonous.
- 6 Find out how carbon monoxide can be detected, and ways of preventing poisoning. Use your findings to produce a poster or leaflet that could be given to people to help them to make sure their house is safe.