Sulfur dioxide

Substance	Hazard	Comment
Sulfur dioxide *Gas*	 **CORROSIVE**  **TOXIC**	DANGER: causes severe skin burns and eye damage; toxic if inhaled. Effects of exposure by inhalation may not be immediately apparent and can develop or increase over time. Inhalation by those with known breathing difficulties, eg asthma, may exacerbate such pre-existing conditions. Adverse health effects may be apparent even at very low levels, ~ 0.3 mg m^{-3} (0.1 ppm). Previously, the HSE has said for a 15-minute exposure, the concentration of the gas in the atmosphere should not exceed 2.7 mg m^{-3}. It is produced naturally in large amounts by volcanoes. Most fossil fuels contain traces of sulfur compounds. When burnt, these result in sulfur dioxide released into the atmosphere, causing acid rain. It may be produced in the laboratory by the action of heat or dilute acid on sulfites or thiosulfates. It is used in small amounts as a preservative in some foodstuffs and wines. Approved food additive, E220.
Sulfur dioxide *Dilute solution in water*	 **IRRITANT**	The gas is very soluble in water and may cause suck back. Alternatively, a sulfur dioxide solution can be prepared using sodium metabisulfite and adding sulfuric acid. The gas escapes easily from solution, especially if this is warmed, and should not be inhaled.

Typical control measures to reduce risk

- If preparing the gas in test-tube reactions, use the smallest amounts possible.
- Wear eye protection.
- Take steps to prevent suck back of water, eg by the use of Bunsen valves.
- Use a fume cupboard for anything larger than test tube amounts of gas; ensure good laboratory ventilation and quickly dispose of solutions containing sulfur dioxide.
- If testing for the gas by its smell, follow the safe technique for sniffing gases: use your hand to waft the gas towards your nose.
- Do not expose asthmatics to the gas.
- Use fuels which are naturally low in sulfur, remove sulfur compounds before use or use scrubbers to absorb sulfur dioxide from the exhaust gases of coal or oil burning power stations.

Assessing the risks

- What are the details of the activity to be undertaken? What are the hazards?
- What is the chance of something going wrong?
  eg a leak of gas into the laboratory from apparatus or a warmed solution, or suck back.
- How serious would it be if something did go wrong?
- How can the risk(s) be controlled for this activity?
  eg can it be done safely? Does the procedure need to be altered? Should goggles or safety spectacles be worn?

Emergency action

In all emergency situations, alert the responsible adult immediately. Be aware that actions may include the following:

- In the eye — Irrigate the eye with gently-running tap water for at least 20 minutes. Call 999/111.
- Vapour breathed in — Remove the casualty to fresh air. Call 999/111 if breathing is difficult.
- Gas escape in a laboratory — Open all windows. If over 1 litre of gas is released, evacuate the laboratory.

