

Bromine

including bromine water

Substance	Hazard	Comment
Bromine Liquid	TOXIC CORROSIVE ENVIRON. HAZARD	DANGER: fatal if inhaled; causes severe skin burns and eye damage; very toxic to aquatic organisms. Effects of exposure by inhalation can increase over time. Inhalation by those with known breathing difficulties (eg asthma) may exacerbate such pre-existing conditions. For a 15-minute exposure, the concentration of the vapour in the atmosphere should not exceed 1.3 mg m ⁻³ . Keep the following next to liquid bromine at all times: At least 500 cm ³ of 1 M sodium carbonate and also a container of solid hydrated sodium carbonate (washing soda) for treating spills on hard surfaces.
Moderately concentrated bromine solution In water or organic solvents (if 0.2M or more)	CORROSIVE	DANGER: causes severe eye damage; irritating to skin. Bromine rapidly diffuses out of solution, producing a vapour which is very toxic if breathed in. Effects of exposure by inhalation can increase over time. Inhalation by those with known breathing difficulties (eg asthma) may exacerbate such pre-existing conditions. A saturated solution in water is about 0.25 M. There may also be hazards associated with the organic solvent; see relevant CLEAPSS Student Safety Sheets.
Moderately dilute bromine solution In water or organic solvents (if 0.06 M or more but less than 0.2 M)	IRRITANT	WARNING: irritating to eyes and skin. Bromine rapidly diffuses out of solution, producing a vapour which is very toxic if breathed in. Effects of exposure by inhalation can increase over time. Inhalation by those with known breathing difficulties (eg asthma) may exacerbate such pre-existing conditions. There may be hazards associated with the organic solvent; see relevant CLEAPSS Student Safety Sheets.
Very dilute bromine solution In water or organic solvents (if less than 0.06 M)	IRRITANT	There may be hazards associated with the organic solvent; see relevant CLEAPSS Student Safety Sheets. 0.002 M is suitable for testing alkenes for unsaturation and for halogen/halide displacement reactions.

Typical control measures to reduce risk

- Use the lowest concentration and smallest volume possible.
- Wear eye protection and protective nitrile gloves for all but very dilute bromine solution.
- Avoid breathing the fumes from concentrated solutions, eg by using a fume cupboard.
- When bromine liquid is in use, have plenty of 1 M sodium carbonate solution available to deal with spills.

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?
- 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 even slightly affected.

• In the mouth/swallowed Do no more than rinse and spit with drinking water. Do not induce vomiting. Call 999/111.

• Spilt on the skin or clothing Remove contaminated clothing. Irrigate the affected area with gently-running tap water for

at least 20 minutes. Call 999/111 as appropriate. Rinse clothing.

• Spilt on the floor, bench, etc For spills of all but a few drops of liquid bromine, open windows and evacuate the

laboratory. For small bromine spills, add solid hydrated sodium carbonate (or 1 M sodium carbonate solution) and leave for 1 hour. Mop up and rinse with plenty of water.