Mercury and its compounds

including **Mercury(I/II) oxides, chlorides, sulfides**

Substance	Hazard	Comment
Mercury Metal		DANGER: fatal if inhaled; causes damage to organs through prolonged or repeated exposure; may damage unborn child. Very toxic to aquatic life. Mercury is very dense - containers may be unexpectedly heavy - difficult to manipulate, eg in teat pipettes. Not trapped by filter fume cupboards. Clear up spills promptly, but do not panic. The main risk is from inhaling low concentrations of vapour over long periods of time from spills that were not noticed/cleared up. Wear gloves when handling mercury. It forms alloys with gold, silver, etc (eg, jewellery) - remove rings.
Mercury(II) chloride, mercury(I/II) oxides, sulfides Solids **Mercury(II) chloride** Solution *(if 0.1 M or more)*		DANGER: fatal if swallowed or in contact with skin; causes severe burns and eye damage; suspected of causing genetic defects and damaging fertility; causes damage to organs through prolonged or repeated exposure. Very toxic to aquatic life. Mercury ('button') batteries contain mercury oxide and should be recycled. Mercury compounds used in making Victorian hats caused disease, as in the 'Mad hatter' of *Alice in Wonderland*.
Mercury(II) chloride Solution *(if 0.01 M or more but less than 0.1 M)*		DANGER: fatal if swallowed or in contact with skin; suspected of causing genetic defects and damaging fertility; causes damage to organs through repeated or prolonged exposure. Very toxic to aquatic life.
Mercury(II) chloride Solution *(if 0.002 M or more but less than 0.01 M)* and **Mercury(I) chloride, Mercury(II) sulfide**		WARNING: harmful if swallowed or in contact with skin; suspected of causing genetic defects and damaging fertility; causes damage to organs through repeated or prolonged exposure. Very toxic to aquatic life. Pollution by mercury compounds in a Japanese river in the 1950s caused serious poisoning of humans who ate river fish (Minimata disease).
Mercury(II) chloride Solution*(if less than 0.002M)*	LOW HAZARD	Note these solutions are extremely dilute.

Typical control measures to reduce risk

- Wear eye protection and suitable gloves; use the lowest possible concentration.
- Avoid the use of mercury compounds where possible (eg, avoid Millon's reagent).
- Handle liquid mercury over a tray to contain spills; do not leave mercury surfaces exposed to the air.
- Avoid raising dust (eg, by dampening powder); work in a ducted (not filter) fume cupboard; clear up spills promptly.

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, solution spurts out of a test tube when heated, mercury metal spills on the floor or a thermometer is broken.
- ***How serious would it be if something did go wrong?*** *eg, could anybody be exposed to dangerous mercury levels for long periods of time?*
- ***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 the eye** Flood the eye with gently-running tap water for at least 10 minutes. Consult a medic.
- **Swallowed** There is little problem with mercury metal (but consult a medic). For compounds, do no more than wash out the mouth with water. Do **not** induce vomiting. Consult a medic.
- **Vapour breathed in** Dangerous only if large amounts of vapour are breathed in over a short period of time (eg, when heating metal) or from long-term exposure. Consult a medic.
- **Spilt on the skin or clothing** For mercury metal, remove contaminated clothing and wash off the skin. Check jewellery for damage. For mercury compounds, flood the area with large amounts of water. Remove and repeatedly rinse clothing. Consult a medic for large areas affected or if blistering occurs.
- **Spilt on floor, bench, etc** For metal, remove jewellery, collect mechanically (eg, with syringe). Mop up remainder with a hot paste of 1:1 calcium oxide/sulfur in water. Spread same (dry) mixture over cracks etc. For compounds, scoop up solid. Rinse area with water, diluting greatly. For solutions, use mineral absorbent (eg, cat litter).

