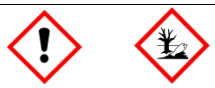
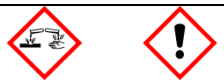
# Student safety sheets 40

# Copper and its compounds

## *including* Copper oxides, carbonate, sulfate, chloride, nitrate

| Substance | Hazard | Comment |
|---|---|---|
| **Copper** (metal) | LOW HAZARD | Sharp edges can present a risk of cuts. |
| **Copper(I)/(II) oxides**<br>Cuprous / cupric oxide |  <br>CORR.* IRRITANT ENVIR. | DANGER. Copper(I) oxide: *causes serious eye damage; skin irritant; harmful if swallowed/inhaled; toxic to aquatic life.<br>WARNING. Copper(II) oxide: causes serious eye irritation; skin; harmful if swallowed/ inhaled; toxic to aquatic life. |
| **Copper(II) carbonate hydroxide**<br>Basic copper carbonate |  <br>IRRITANT ENVIRONMENT | WARNING. Copper(II) carbonate hydroxide: causes serious eye irritation; skin irritant; harmful if swallowed/inhaled, toxic to aquatic life.<br>Also known as *malachite*. |
| **Copper(II) sulfate** *and* **copper(II) nitrate**<br>solids *and* concentrated solutions |  <br>CORR. IRRITANT ENVIR*. | DANGER. Solids and solutions (≥ 1.0M sulfate, ≥ 1.3 M nitrate): skin irritant; cause serious eye damage; harmful if swallowed (especially saturated solutions for crystal-growing). Solid* only: very toxic to aquatic life.<br>Water added to anhydrous solid copper(II) sulfate(VI) produces heat. |
| **Copper(II) sulfate** *and* **copper(II) nitrate**<br>dilute solutions |  <br>CORROSIVE IRRITANT | DANGER. Sulfate/nitrate <1.0M/1.3M and ≥0.2M/0.15M: skin irritant; cause serious eye damage.<br>WARNING Sulfate/nitrate <0.2M/0.15M and ≥0.02M/0.05M: irritating to skin and eyes.<br>LOW HAZARD Sulfate/nitrate <0.02M/0.05M.<br>Benedict's solution and Fehling's solution both contain dilute copper(II) sulfate(VI) but Fehling's solution has other hazards. |
| **Copper(II) chloride**<br>solid |  <br>IRRITANT ENVIRONMENT | WARNING. Eyes; skin; harmful if swallowed; toxic to aquatic life. |
| **Copper(II) chloride**<br>solution<br>*(if 0.8M or more)* |  <br>IRRITANT | WARNING. Eyes; skin; toxic to aquatic life; harmful if swallowed (≥ 1.8M). |
| **Copper(II) chloride**<br>solution *(if less than 0.8M)* | LOW HAZARD | |

## Typical control measures to reduce risk

- Use the lowest concentration possible.
- Avoid raising dust, eg by dampening powders
- Take care if evaporating solutions to dryness
- Wear eye protection when handling the solids and all but the most dilute solutions

## 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, solutions spurting out of test tubes when heated or solutions decomposing to toxic products when heated to dryness*
- ***How serious would it be if something did go wrong?***
  *eg, are there hazardous reaction products (such as chlorine from the electrolysis of copper chloride)?*
- ***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 10 minutes. Consult a medic.
- **Swallowed** — Do no more than wash out the mouth with drinking water. Do **not** induce vomiting. Consult a medic.
- **Dust breathed in** — Remove the casualty to fresh air. Consult a medic if breathing is difficult.
- **Spilt on the skin or clothing** — Remove contaminated clothing and rinse it. Wash off the skin with plenty of water
- **Spilt on the floor, bench, etc** — Scoop up solid (take care not to raise dust). Wipe up small solution spills or any traces of solid with cloth; for larger spills use mineral absorbent (eg, cat litter).