







Alkali metals

includes lithium, sodium, potassium

Substance	Hazard	Comment
Lithium <i>solid</i>	  FLAMM. CORROSIVE	DANGER: It causes severe skin burns and eye damage; in contact with water releases flammable gases which may ignite spontaneously; reacts violently with water. With water produces hydrogen, an extremely flammable gas (see CLEAPSS <i>Student Safety Sheet 50</i>). Although difficult to ignite, once lit, it burns readily in air and is difficult to extinguish. It reacts violently with many substances.
Sodium <i>solid</i>	  FLAMM. CORROSIVE	DANGER: It causes severe skin burns and eye damage; in contact with water releases flammable gases which may ignite spontaneously; reacts violently with water. With water produces hydrogen, an extremely flammable gas (see CLEAPSS <i>Student Safety Sheet 50</i>). It burns vigorously and is difficult to extinguish. Contact with moisture produces sodium hydroxide which is corrosive (see CLEAPSS <i>Student Safety Sheet 31</i>). It reacts violently with many substances.
Potassium <i>solid</i>	  FLAMM. CORROSIVE	DANGER: It causes severe skin burns and eye damage; in contact with water releases flammable gases which may ignite spontaneously; reacts violently with water. With water produces hydrogen, an extremely flammable gas (see CLEAPSS <i>Student Safety Sheet 50</i>). It burns vigorously and is difficult to extinguish. Contact with moisture produces potassium hydroxide which is corrosive (see CLEAPSS <i>Student Safety Sheet 31</i>). It reacts violently with many substances. Over a period of years, it may develop a coating of yellow superoxide. Under slight pressure, eg, from a knife blade, this may explode.

Typical control measures to reduce risk

- Store alkali metals under liquid paraffin (mineral oil) and check there is sufficient liquid.
- Check potassium samples regularly for signs of custard yellow coating; if found dispose of sample safely.
- Handle sample using forceps, wear eye protection and use safety screens.
- Conduct all investigations on a small scale - generally use a rice grain-sized piece.
- Make sure everybody involved (eg, technicians clearing away) understands the hazards.
- Take steps to prevent theft.

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, could molten, corrosive metal spit out of a container?
- **How serious would it be if something did go wrong?**
NB There are occasional reports of pupils being taken to hospital (for treatment to cuts or as a result of chemical splashes) as a result of explosions of apparatus involving sodium.
- **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 20 minutes. Consult a medic. If it is necessary to go to hospital, continue washing the eye during the journey in the ambulance.
- **Swallowed** Do no more than wash out the mouth with drinking water. Do **not** induce vomiting. Consult a medic.
- **Spilt on the skin or clothing** Remove any pieces of solid with forceps. Then drench the skin with plenty of water. If a large area is affected or blistering occurs, consult a medic.
- **Metal catches fire** For sodium and potassium, smother with clean, dry sand. For lithium, smother with dry sodium chloride, **not** sand.
- **Spilt on the floor, bench, etc** Scoop up as much metal as possible into a dry container. Cover the area with dry sand or anhydrous sodium carbonate (or, for lithium, sodium chloride) and scoop into a dry bucket for further treatment. Rinse the area with plenty of water and mop.