

Alkali metals

lithium, sodium *and* potassium

Substance	Hazard		Comment
Lithium (metal) <i>solid</i>	 FLAMMABLE	 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 Student Safety Sheet 50). Although difficult to ignite, once lit, it burns readily in air and is difficult to extinguish. It reacts violently with many substances.
Sodium (metal) <i>solid</i>	 FLAMMABLE	 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 Student Safety Sheet 50). It burns vigorously and is difficult to extinguish. Contact with moisture produces sodium hydroxide which is corrosive (see CLEAPSS Student Safety Sheet 31). It reacts violently with many substances.
Potassium (metal) <i>solid</i>	 FLAMMABLE	 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 Student Safety Sheet 50). It burns vigorously and is difficult to extinguish. Contact with moisture produces potassium hydroxide which is corrosive (see CLEAPSS Student Safety Sheet 31). 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 the 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.
- Ensure a container of **dry** sand is available at all times for smothering metal fires.

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?
Note: There are occasional reports of pupils being taken to hospital following explosion of apparatus during practicals involving sodium. Injuries include cuts and/or chemical splashes.
- 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. If it is necessary to go to hospital, continue washing the eye during the journey in the ambulance.
- 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 any pieces of solid with forceps. Irrigate the affected skin area with gently-running tap water for at least 20 minutes. If a large area is affected or symptoms occur, call 999/111.
- Metal catches fire Smother with clean, dry sand. Have a container of this sand to hand.
- 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 and scoop into a dry bucket for further treatment. Rinse the area with plenty of water and mop.