

### Information Sheet: Peroxidisables and Explosives

#### Purpose

The purpose of this information sheet is to guide workers and supervisors in general precautions and emergency responses for peroxidisables and explosives. This information sheet should be read in conjunction with the [Chemical Safety Management](#) handbook chapter.

#### Q1 What are peroxidisables and why do they warrant special care?

- A peroxidisable compound is any compound that can easily form peroxides by exposure to atmospheric oxygen and/or UV radiation. Peroxides are unstable chemicals that can easily detonate through minor shock/friction i.e. they can decompose, ignite or detonate when exposed to friction (e.g. on the threads of a screw-capped container), striking, vibrating, or otherwise agitating.
- These substances can deteriorate to an explosive compound by drying, contamination, exposure to air and light, or mixing with dust, paper or organics (e.g. ethanol).
- The shelf-life (time under normal and appropriate storage conditions before occurrence of significant peroxidation products) varies between compounds and conditions of storage. Some of these compounds can be purchased with an antioxidant stabiliser which retards (but does not prevent) the rate of peroxide formation. Users should purchase stabilised reagents unless the antioxidant interferes with its use.

#### Q2 What precautions do I need to know about when working with peroxidisables?

- Conduct a risk assessment, and if you are a student you must get sign off from your supervisor before commencing this activity.
- Plan ahead and if you have any concerns consult your supervisor or an expert before proceeding with the work
- Formulate an emergency plan before starting any experiment containing explosive or potentially explosive chemicals.
- Read the relevant safety data sheet to assess required controls.
- Inform your supervisor and all the people working in your laboratory each time you commence the work, and place signs on the entrance door.
- Due to the potential for explosion limit the number of chemical bottles and other breakable items within the immediate vicinity of any bottle containing peroxidisables.
- Minimise the quantities used in a procedure to a minimum and do not store large quantities.
- Protect yourself by:
  - working inside a fume cupboard;
  - wearing PPE (including face and eye protection); or
  - remote handling if highly sensitive.
- If leaving the experiment make sure you signpost the door (with a warning sign and your contact details) so everyone who gains access to the laboratory is informed. Ensure that before leaving the area and experiment they are rendered as safe as practicable.

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### Q3 How should I store peroxidisables?

- It is strongly suggested that any containers of peroxidisables which have any of the following characteristics be disposed of immediately (if you are concerned please **do not handle**, contact the local [HSW Team](#). (for assistance):
  - old or obviously in poor condition, or
  - have visible crystals or solids, or
  - have been opened more than 12 months ago or purchased more than 18 months ago but unopened (even when an inhibitor has been added).
- Because distillation of the stabilised solvent will remove the stabiliser, the distillate must be stored with care and monitored for peroxide formation.
- Un-stabilised compounds should not be kept for more than 24 hours.
- Peroxide-forming compounds should never be stockpiled. They should be purchased in limited quantities to minimise in-house storage time.
- Containers of potential peroxide forming compounds must be handled with extreme caution. The friction from unscrewing the cap of a container of ether that has decomposed can provide enough energy to cause a violent explosion. Also containers may have a high internal gas pressure, due to decomposition.
- Date these chemicals when they are received and when they are opened and schedule disposal in the School's Schedule of Programmable Events or in another system.
- Peroxide-forming compounds should be clearly identified by additional labelling.
- These compounds are to be stored in closed containers (preferably in the container furnished by the supplier) away from light and heat.
- If refrigeration is required only completely spark-proof refrigerators are to be used to store ethers or other volatile peroxide-formers.
- These chemicals must be securely stored to prevent unauthorised access.

### Q4 What are explosives and why do they warrant special care?

- Explosive compounds are classified under Dangerous Goods Class 1 or GHS Explosive Divisions 1.1 – 1.6 and are inherently explosive by shock, fire, friction or other sources of ignition. These compounds can easily cause major injuries to individuals who handle them and anyone working nearby.
- From the [Explosives Act 1936](#) and [Explosives Regulations 2011](#) explosive means:
  - gunpowder, nitro-glycerine, all compounds and mixtures containing nitro-glycerine, gun-cotton, blasting powder, fulminate of mercury or of other metal, coloured fires, and every other substance, whether similar to those abovementioned or not, used or manufactured with a view to produce a practical effect by explosion or a pyrotechnic effect; and
  - fog-signals, fireworks, fuses, rockets, percussion caps, detonators, cartridges, ammunition of all descriptions, and every adaptation of preparation of an explosive as defined above; and
  - a model rocket engine for educational programs.

For (a) type explosive the quantity must not exceed 3 kg without a licence

For (b) please refer to the HSW Handbook Chapter [Firearms Safety Management](#).

For (c) the School/Branch must apply for a permit from [SafeWork SA](#).

### Q5 What precautions do I need to know about when storing and working with explosives?

- Consult the safety data sheet for storage and handling procedures for explosives.
- Conduct a written risk assessment which is signed off by your supervisor or subject matter expert prior to undertaking the activity.
- Ensure that you do not store any more than is necessary for your experiments.
- These chemicals must be securely stored to prevent unauthorised access.

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**Q6 Can I transport explosives**

- For requirements on transportation of explosives please contact the local [HSW Team](#) for advice.

**Q7 How do I dispose of peroxidisables and explosives?**

- For requirements on disposal please contact the local [HSW Team](#) for advice.

**Q8 Where do I obtain further information on peroxidisables and explosives?**

If you require further information, please contact a member of the local [HSW Team](#).

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