

# Answers to module 5

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## Final learning assessment

1. Many compounds are unstable and can decompose rapidly, examples are **inorganic** and **organic azides, chlorates** and **perchlorates**. Avoid grinding and drying operations with unstable compounds as they could detonate and cause an explosion.
2. **Pyrophoric materials** (e.g. lithium alkyls, metal hydrides) spontaneously combust on contact with air: take extreme care when handling these materials.
3. Avoid adding water to a concentrated acid. Adding acid to water is an inherently safer process.
4. Keep the maximum size of bench containers less than 500 ml. This reduces the risk of spillage and consequence from an incident.
5. Work equipment constructed from glass needs special consideration when used above or below atmospheric pressure. The stored energy involved means that any breakages will be accompanied by flying glass, so items such as glass vacuum desiccators should be protected with a wire framework or cage. Admit air carefully and gradually before opening.
6. Wear gloves when handling chemicals. They should be of a suitable material to offer protection from the substance in use. Information is contained in the safety data sheet on suitable gloves.
7. Consult manufacturers' charts to check 'breakthrough times'. Discarded gloves may be classified as hazardous waste for disposal purposes.
8. The sash should be kept closed when you are not actively working in at the fume cupboard. In the event of an explosion, the sash acts as a shield and it also provides containment in the event of fire.
9. Keep electrical equipment away from flammable materials and from water.
10. If you are storing flammable materials in a fridge, then make sure that the fridge is rated for flammable atmospheres, i.e. it is 'spark free'.
11. Any spillages on the bench should be cleaned up immediately, while being mindful of the nature of the chemicals involved.
12. Burns can be thermal or chemical. They should be immersed in cold water immediately, or washed in running water for a length of time to cool or removed from contamination before covering with a dry dressing.
13. Be aware of the emergency first aid measures required. Specifically, take note of the materials being used and the advice given on the safety data sheet (SDS) for the treatment of exposure.