

lechyd a Diogelwch – Health and Safety

CHEMICAL SAFETY – SAFE STORAGE OF CHEMICALS

This Information Sheet provides guidance on how chemicals should be stored in order to protect both people and the environment. It should be read in conjunction with other supporting Information Sheets eg 'Identifying Chemical Hazards' and 'Disposing of Chemical Wastes'.

Unless chemicals and chemical waste are stored correctly the health and safety of individuals may be compromised and the environment put at risk. The following is an example of what can wrong if chemicals are stored incorrectly:



This fire was caused by storing large quantities of flammables with oxidisers

What is Storage?

Storage doesn't just refer to chemicals that are locked away in a safety cabinet. You must also consider those chemicals that are being used daily eg those on the lab bench, chemicals on shelves, waste chemicals or any new chemicals you are thinking of ordering.



General Principles of Storage

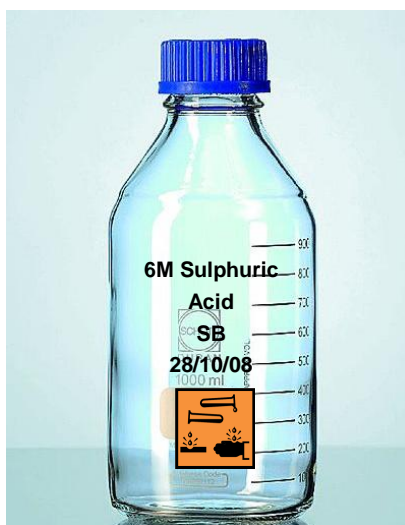
- Only store minimum quantities of chemicals in laboratories. As a guideline a total volume of flammable liquids in a laboratory should not exceed 50 litres, and the total of any one flammable chemical should not exceed 5 litres.
- Never use Fume Hoods to store chemicals on a long term basis.



- Bulk chemicals should be stored in suitably risk assessed facilities. External chemical stores are available for storing bulk chemicals.
- Hazardous waste chemicals should be disposed of promptly and properly (*see Information Sheet – Safe Disposal of Chemicals*).
- Always use an appropriate bottle carrier when transporting 2.5 litres or more of liquid chemicals.
- If using shelves for storage never:
 - Overload the shelves.
 - Store hazardous liquids or glass containers above head height.
 - Store heavy items above shoulder height.
 - Stand on a bench or a chair to reach something.









- When storing chemicals you have prepared eg mixtures / solutions always:
 - Use an appropriate container (seek advice if unsure).
 - Label the chemical container clearly with the name, concentration, associated hazards, your name and date.



Specialist Requirements

Some chemicals require storing in appropriate storage cabinets eg solvents. Such chemicals should also be stored in bunded trays so any leaks will be captured.

Hazard	Risk Phrases	Correct Storage
EXPLOSIVE 	R1, R2, R3, R4, R5, R6	Always seek advice from a suitably qualified person eg experienced Lab Technician or H&S Adviser before purchasing or storing explosive chemicals.
VERY TOXIC 	R26, R27, R28	These must be stored in an appropriate locked Poisons Cabinet.
FLAMMABLE / HIGHLY FLAMMABLE 	R10, R11, R12	These must be stored in fire proof cupboards and properly bunded.
INFLAMMABLE ORGANIC SOLVENTS 	R10, R11, R12	Inflammable organic solvents must not be kept in refrigerators which are not spark proof.

<p>CORROSIVE</p> 	<p>R34, R35</p>	<p>Concentrated acids must be stored in special cupboards and properly banded. Strong alkalis must be kept separate from strong acids.</p>
<p>OXIDISERS</p> 	<p>R7, R8, R9</p>	<p>Never store with flammables, highly flammables, inflammable organic solvents, explosives and certain other chemicals as described in the relevant Manufacturer's Safety Data Sheet.</p>

Types of Storage Facilities



Poisons Store – this must be kept locked



Ventilated Acid and Solvents Store



Storage container marked to show contents and hazard



External bulk Chemical Store

Regularly check Acid Cabinets for signs of corrosion as it may show the cabinet is not suitable.



Signs of corrosion

Bunding

The volume of the bund should be 110% of the largest container stored in the cabinet.



Bunding tray

Storing Flammable, Corrosive and Oxidising Chemicals on Laboratory Benches

Minimal quantities of flammable, corrosive and oxidising chemicals needed for ongoing experiments can be stored on laboratory benches **BUT ONLY** if the correct container is used. At the end of the experiment the chemicals must either be disposed of or returned to the appropriate store.

Incompatible Chemicals

General Principles – before storing any chemicals, **CHECK** the chart on the following page and remember!



- Always try to segregate organic and inorganic chemicals.
- Keep chlorinated organic liquids and non-chlorinated organic chemicals separate.
- Keep strong acids and strong alkalis separate.
- Keep flammable and oxidising chemicals separate.
- Always think about what was in an empty container before using it. Even if it has been washed out, it may contain residues that are incompatible with the new chemical leading to fire, explosion or production of toxic gases.
- Use vented containers if you think there could be a risk of a build up of pressure.

For further more detailed information on chemical incompatibility refer to the *Information Sheet CS4 – Chemical Compatibility*.

Chemical Storage Compatibility

TYPE	Explosive	Oxidising	Extremely Flammable	Highly Flammable	No Symbol	Very Toxic	Toxic	Harmful	Corrosive	Irritant	Radio-active
Explosive	Y	N	N	N	N	N	N	N	N	N	N
Oxidising	N	Y	N	N	N	N	N	?	N	?	N
Extremely Flammable	N	N	Y	Y	Y	N	N	Y	N	Y	N
Highly Flammable	N	N	Y	Y	Y	N	N	Y	N	Y	N
No Symbol	N	N	Y	Y	Y	N	N	Y	N	Y	N
Very Toxic	N	N	N	N	N	Y	Y	Y	N	Y	N
Toxic	N	N	N	N	N	Y	Y	Y	N	Y	N
Harmful	N	?	Y	Y	Y	Y	Y	Y	N	Y	N
Corrosive	N	N	N	N	N	N	N	N	Y	N	N
Irritant	N	?	Y	Y	Y	Y	Y	Y	N	Y	N
Radio-active	N	N	N	N	N	N	N	N	N	N	Y

KEY:

Y	May be stored together
N	<u>MUST NOT</u> be stored together
?	May be stored together subject to <u>SPECIAL PRECAUTIONS</u>

NOTE:

To prevent fire and explosion organic acids eg acetic and formic acid should be stored separately from common mineral acids such as sulphuric and nitric acid.

Organic acids are generally safe to store with flammables or solvents.

