chemical storage bottles

Posted by Anonymous on Fri, 2016-07-29 17:05

Sign in to rate this response

Answer reviewed 2 March 2023

Generally, the original container in which a chemical is supplied is the most appropriate container in which to store a chemical. These containers or bottles are either made of plastic or glass, which are chemically resistant to the chemical stored within. Containers or bottles are usually supplied with screw cap lids.

Schools routinely decant chemicals and store diluted solutions. It is important to carefully choose the most appropriate container and seal or stopper in which to store these. One type may not necessarily suit all; a survey of a range of manufacturers confirms the great variety of containers and caps which is available and how wide-ranging are the applications for which they are designed.[1-4]

Here are some considerations:

- The container and lid should be chemically resistant to the chemical being stored
- The container should be physically stable in order to reduce the opportunity for the container to tip over or roll off a bench and break. Test tubes and narrow vials are not suitable for storing chemicals. Short squat containers are more appropriate for the school setting.
- Wide mouth containers are suitable for storing solids and viscous liquids while narrow mouth containers are suitable for storing liquids.
- Clear glass enables the contents to be clearly viewed (e.g. recommended for storing lithium and sodium to enable easy viewing of the level of the paraffin oil)
- Amber glass, which protects from light, is recommended for light sensitive chemicals such as silver nitrate.
- There are many types and compositions of caps and liners[4] that may be suitable for purpose.
- Ground glass stoppers can become stuck and are not always easy to remove. They are not recommended for alkali solutions.
- Poly/ rubber stoppers as an alternative to ground glass stoppers are easy to remove.
- Screw cap lids are excellent at preventing a spill in the event the bottle is knocked over. This is an important consideration especially with corrosive and toxic solutions.
- Some screw cap lids have an optional ring which aids in pouring and reducing drips from the bottle.
- Vented screw cap lids are recommended for solutions that may produce gas. For example, Hydrogen peroxide requires a vented lid so that oxygen gas does not build up inside and present an explosion hazard.
- Good laboratory housekeeping is required to ensure the integrity of all containers and caps for the safe storage of chemicals. This is important for corrosive chemicals especially for the caps on bottles of concentrated nitric acid, which degrade over time.

Science ASSIST recommends

- Screw cap lids are used for all containers storing corrosive acids and bases, toxic solutions and any substances that require storing under a liquid, e.g. sodium and lithium.
- A risk assessment of the chemical storage is conducted to determine the suitability and physical condition of the current storage containers.
- Any containers which are identified as requiring substituting, are replaced progressively by prioritising and changing the more hazardous chemicals and solutions first.
- Any decanted chemical be correctly labelled. For further information on labelling see our Information Sheet on Chemical Labels.[5]

References

[1] Thermofisher Scientific, *Laboratory Supplies*, ThermoFisher website. Shop All Products | Thermo Fisher Scientific - AU (accessed March 2023)

[2] Corning Incorporated, *Life Sciences Product Portfolio*, Corning website, https://www.corning.com/au/en/products/life-sciences/product-catalog.html (accessed March 2023)

[3] DWK Life Sciences, *Bottles and closure systems*, DWK website. Closure Systems | DWK Life Sciences (Accessed March 2023)

[4]CP Lab Safety, *Caps and Closures*, CP Lab safety website. Caps and Closures, Black Thermoset Caps, Hole Caps, Non Metal Caps, Sturdee Seal Caps, Metal Caps (calpaclab.com) (Accessed March [2023)]

[5] Science ASSIST, 2023, *AIS: Chemical Labels*, Science ASSIST website, Science ASSIST Information Sheet: Chemical Labels | ASSIST (asta.edu.au)
