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# The Waste-Paper

*The Hazardous Waste Disposal Monthly Update*

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## *How do I dispose of used “DAB” (diaminobenzidine) solutions?*

By [Stephen Elwood](#)

DAB solutions should be collected and disposed of as hazardous waste, with no pre-treatment or neutralization.

While diaminobenzidine has not been the subject of in-depth carcinogenicity studies, it is a known mutagen. A mutagen is a physical or chemical agent that can induce changes in the genetic information of an organism. Further, all members of the benzidine family that have been tested are classified as known or suspect carcinogens and the US National Toxicology Program (NTP) considers all benzidine derivatives carcinogens.

It is a common misconception that simply “treating” DAB solution with sodium hypochlorite (household bleach) serves to detoxify the solution, rendering it non-mutagenic. While hypochlorite may alter the DAB molecule, the resulting byproducts also are mutagenic. For more information on this subject, see Lunn & Sansone’s 1991 article “The safe disposal of diaminobenzidine” in *Applied Occupational and Environmental Hygiene*.

The most commonly accepted treatment method is one that utilizes an acid-permanganate solution. Due to the pH, the resulting solution would be considered hazardous waste as a characteristic corrosive liquid and would then require neutralization to allow disposal via the drain. As this is a lengthy treatment procedure and requires elementary neutralization, EHS does not recommend researchers perform treatment of DAB waste solutions in the lab.

Please collect DAB wastes in a container appropriate to handle the typical quantities generated in your lab. For example, if your lab only generates a half liter of solution per month, don’t store the waste in a five gallon carboy. Be sure to label your DAB solution with a fully completed Hazardous Waste label and bring the container to your building’s chemical waste collection site when full.



*Please bring waste  
to your Collection site on  
Wednesday, June 27th  
Waste Pickup will be Thursday,  
June 28, 2007.*

## *Gas Cylinder Storage*

By [Jim Boehlert](#)

Princeton University’s science and engineering departments conduct research that often involves the use of compressed or liquefied gases. These gases range from compressed air to highly toxic and corrosive gases. Chemical substances in the gaseous phase are readily inhaled and therefore can pose a significant risk of exposure if mishandled. Aside from the chemical hazards of these materials, the pressurized cylinder itself can be dangerous when not handled properly.

Gas cylinders can be pressurized up to 6000 pounds per square inch (psi). Most car tires contain about 35 psi, for comparison. The materials of construction (typically steel or aluminum) required to contain gases at high pressure, result in a container that can be very heavy and awkward to maneuver without the assistance of proper transportation devices. A standard steel tank that stands about 5 feet high can weigh between 200-250 lbs yet have a diameter of only 12-14 inches. This common design requires proper storage and handling techniques to avoid injury or cylinder damage.

Furthermore, an improperly secured cylinder can topple and damage an unprotected valve, ripping open the cylinder. A cleaved valve stem releasing 6000 psi can turn a steel cylinder into a rocket with enough force to penetrate concrete masonry walls or metal doors. The catastrophic potential of loose cylinders and exposed valves is the foundation for the University’s cylinder storage and handling requirements.

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- Cylinders must be secured upright, no more than two per securing strap
- Valves must be protected by a valve cap when not in use
- Highly toxic gases must be stored in proper gas cabinets with ventilation and monitoring
- Use a cylinder cart to transport cylinders to and from work and storage areas
- Inspect all pipes, tubes and fittings for damage and leaks before pressurizing.

All cylinders are considered hazardous materials, regardless of contents. They are never to be purchased on a University credit card. Cylinders must be obtained through your department's purchasing office.

Further information on cylinder storage, handling and management can be found online in the EH&S website.

[http://web.princeton.edu/sites/ehs/labguide/sec\\_2f.htm](http://web.princeton.edu/sites/ehs/labguide/sec_2f.htm)

## The Waste-Paper

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