

Chemical Waste Fact Sheet— No. 4

Disposal Options for Lecture Bottles

The current state of the disposal industry is such that it is very expensive to dispose of unwanted lecture bottles. Disposal prices recently quoted to DEHS range from \$100 per cylinder for inert gases, to over \$1,000 for unusual and/or highly toxic gases. Your assistance can greatly minimize the costs incurred by campus to dispose of lecture bottles.

DEHS does not collect lecture bottles for disposal. Instead, DEHS provides assistance to the campus community in pursuing various methods for disposing of these cylinders. This guide contains sufficient information to meet the needs of most campus individuals.

Disposal Strategies

Full or partly full lecture bottles

In order of priority, you should pursue the following options:

1. These should be redistributed to other campus users if at all possible. If you are in the School of Chemical Sciences, contact Billy Hardas (hardas@uiuc.edu or 3-6365); otherwise contact DEHS (css@uiuc.edu or 4-9278) for assistance.
 2. If the gas is a freon, it may be possible to recycle it through UIUC's Operations & Maintenance. Contact DEHS (css@uiuc.edu or 4-9278) for assistance.
 3. If redistribution is not an option, return the cylinder to the manufacturer. Consult "Chemical Waste Fact Sheet—No. 2: Gas Cylinder Returns" for information.
 4. If the gas is one of the non-hazardous gases listed below, you may vent the gas to a fume hood then dispose of the cylinder as described in the section "Empty Lecture Bottles."
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|----------------|----------|
| Air | Krypton |
| Argon | Neon |
| Carbon Dioxide | Nitrogen |
| Helium | Xenon |
5. If none of these options work for you, contact DEHS (css@uiuc.edu or 4-9278) for assistance.

Empty Lecture Bottles

In order of priority, you should pursue the following options:

1. If you are in the School of Chemical Sciences, contact Billy Hardas (hardas@uiuc.edu or 3-6365).
2. Return the cylinder to the manufacturer. Consult "Chemical Waste Fact Sheet—No. 2: Gas Cylinder Returns" for information.
3. Remove the valve and recycle the empty metal carcass. See recommended procedures below.

Procedures for removing valves from lecture bottles

Hazards

Removal of a lecture bottle valve can present a significant hazard if the cylinder is not fully discharged or if there are hazardous chemical residues present. Cylinders that held flammable gases may still present a fire or explosion hazard, while those that held corrosive, poisonous, or reactive gases may still have sufficient residues to present a hazard to the person working with the cylinder.

Personal Protective Equipment

Eye protection and gloves should be worn. In most cases, nitrile gloves should be sufficient to protect against exposure to residues. If you are working with a cylinder that contained a highly reactive or highly toxic gas such as hydrogen cyanide, carbon monoxide or arsine, additional precautions will be necessary. In general, pyrophorics (flammable upon contact with air) and sulfides (which may be mistaken for a gas leak) should be excluded from this procedure. Contact DEHS (css@uiuc.edu or 4-9278) for assistance.

Procedures

1. Ensure that the cylinder is empty.
 - a. Visually inspect the valve to see if there is an obvious physical defect or corrosion that may have affected the valve. If there is a defect or corrosion problem, do not attempt to manipulate the valve. Rather cap or plug the outlet and contact DEHS for advice.
 - b. If the valve appears to be safely operable, place the lecture bottle in a fume hood and carefully open the valve. Allow the cylinder to set for a few minutes to assure that the pressure inside the cylinder is at the ambient level.
2. Remove the valve.
 - a. For propane tanks and similar: Remember that these tanks contained a highly flammable gas. If possible, purge three times with nitrogen. Secure the cylinder in a vise and remove the valve. The empty cylinder may be sent to a metals recycler.
 - b. For calibration gas tanks: Secure the cylinder in a vise and remove the valve. Disable the cylinder by removing the additional internal valve. Alternatively, drill a hole in the side of the cylinder so it cannot be repressurized. Remove the label and send the cylinder to a metals recycler.
 - c. For lecture bottles: Assess possible hazards from gaseous residues and select personal protective equipment, as appropriate. Purge the cylinder three times with nitrogen to displace as much of the gaseous residues as possible. Place the cylinder in a vise and remove the valve. Alternatively, the cylinder may be cut in half. Rinse the inside of the cylinder three times with water. Send the cylinder to a metals recycler.

Recordkeeping

If the cylinder has a DEHS barcode on the bottle please contact DEHS (css@uiuc.edu or 4-9278) whenever you dispose or transfer the cylinder to another location so that our records can be updated.