

By: Amanda  
Stinnett



*Amanda Stinnett has earned a B.S. in Public Health from IUPUI and is a Certified Hazardous Materials Manager. Amanda has served as an Environmental Specialist with the Office of Environmental Health and Safety at IUPUI since 2005. E-mail Amanda Stinnett at: [asfoti@iupui.edu](mailto:asfoti@iupui.edu)*

## How to Dispose of Empty Chemical Containers

I am often asked if it is permissible to throw away empty chemical containers into the general trash. The answer depends on the chemical the container once contained. Some empty containers are actually hazardous wastes because of the residues they contain.

A container is a device in which material is stored, transported, treated or disposed. If the container held a material regulated as a hazardous waste, then the amount and type of residue left in the container must be evaluated before discard.

The Environmental Protection Agency (EPA) regulation that oversees disposal of regulated hazardous waste is known as the Resource Conservation and Recovery Act (RCRA). Wastes can be hazardous because of their characteristics (ignitable, corrosive, reactive, or toxic). There are also listed hazardous wastes, which include spent materials (F- and K-listed) and discarded chemical products (U- and P-listed wastes). Regulated chemicals that have been determined by EPA to pose an acutely toxic hazard are on the P-list.

P-listed waste containers are regulated as a hazardous waste, even when all material has been removed by normal means (pouring, pipetting, etc.). All P-listed containers must be disposed through Environmental Health & Safety as chemical waste. Common examples include sodium azide, acrolein, osmium tetroxide, and 2,4-dinitrophenol, among others. P-listed chemicals are defined as the commercially pure grade of the chemical, any technical grades of the chemical, or all commercial formulations with a P-listed chemical as its sole active ingredient. Spent or used mixed wastes containing P-listed materials are no longer P-listed. Diluting P-listed chemicals by adding water or other chemicals to circumvent disposal as a hazardous waste is strictly prohibited by law. Please review the

full list of P-listed materials can be found here: [P-Listed Chemicals](#).

Here are some examples to clarify:

1. You have a bottle of sodium azide 99.99%, CAS number 26628-22-8. Sodium Azide is a P-listed material (P105) so even when empty, you should dispose of it through EHS. Do NOT rinse the container.
2. You use a buffer that contains .01% sodium azide as a preservative. Sodium azide is not the sole active ingredient in this product therefore this is NOT a P-listed material. If the container is empty meeting the below definition, you can throw this container in the trash.
3. You purchased osmium tetroxide, 4% solution from Sigma Aldrich. The container is now empty. Because Osmium tetroxide is a P-listed material and the sole active ingredient, it should be disposed as chemical waste through EHS. It does not matter what the concentration is if the P-listed material is the sole active ingredient in a commercial formulation.

For all other regulated hazardous wastes, the container is considered empty when:

- All material that can be removed by normal means (pouring, pipetting, aspirating, etc.) has been removed; and,
- No more than 3 percent material by weight remains inside a container.

Containers not meeting the definition of empty must be disposed as chemical waste through Environmental Health & Safety. Containers that do meet the definition of empty, or those that contained non-hazardous wastes can be disposed in the general trash or glassware boxes in your laboratory.

For more information on hazardous waste, please visit <http://www.epa.gov/waste/hazard/index.htm>.



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*Lab Notes is a quarterly publication by the IUPUI Office of Environmental Health and Safety.  
Lab Notes is designed, edited and published by K. Lee Stone.*

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