

Office of Research Safety
Laboratory Safety Manual
225 Hazardous Waste

1. WHAT IS NOT A WASTE MATERIAL?

1. Any materials that can not be reused, or is spent and that must be disposed of. Material that is still "good" or "reusable" is not waste. Material that can be redistributed to other KSU Labs or areas is not waste.

2. WHAT IS A HAZARDOUS WASTE?

1. A Hazardous Waste is a waste material that meets one or more of the following definitions or is otherwise dangerous to human safety and/or the environment:
2. **FLAMMABLE / IGNITABLE:** Any material having a flashpoint of less than 140 degrees Fahrenheit/60 degrees Celsius. This will include most non-halogenated solvents. Water soluble solvents such as ethanol and acetone are also covered by this regulation if the flashpoint of the material or the mixture is below 140 degrees Fahrenheit/60 degrees Celsius. Any material which by its nature is considered to be a flammable solid such as Sodium Metal, Solid Naphthalene, and Nitrocellulose.
3. **TOXIC:** Any material which by nature of its active ingredients is considered to be a poison, carcinogen, mutagen or other reproductive hazard, or is capable of causing harm to the environment.
4. **CORROSIVE:** Any material having a pH of less than 2 or more than 12.5 must be treated as hazardous waste and cannot be disposed of in the sanitary sewer without first being neutralized, provided it has no other dangerous properties such as toxicity.
5. **REACTIVE:** Any material that is unstable, explosive, water or air reactive, strong oxidizer, organic peroxide, cyanide and sulfide bearing materials that release toxic gases in contact with acid.
6. **BIOHAZARDOUS:** Human or Animal tissue or fluids that are contaminated or may be contaminated with pathogenic organisms and/or toxic chemicals. Tissue or fluids that have been thoroughly sterilized by autoclaving, chemical sterilization or other methods are not considered to be biohazardous waste, but may still need special disposal.
7. **LISTED WASTE:** Waste that is listed on the non-specific sources (F-list), the specific sources (K-list), the certain discarded products list (U-list) or the acutely hazardous discarded products (P-list).

3. LABELING OF WASTE CONTAINERS

1. All hazardous waste containers must have a label that states "**HAZARDOUS WASTE,**" and the specific names of the wastes. Do not use abbreviations or chemical formulas.

4. PROPER CONTAINERS

1. Generally the best containers for hazardous waste are the ones that the materials originally came in. Other containers, such as 5 gallon jugs are acceptable as long as the containers and any residue left inside are compatible with the waste material. All containers must have tight-fitting lids, no corks or ground glass stoppers. Parafilm is not a substitute for a tight fitting lid.
2. When not actually pouring waste into or out of the container the top must be securely fastened. You cannot leave a funnel sitting in the container. The only exception to this is for processes such as HPLC that runs and adds waste to

the container continuously. When the HPLC process is not running the top must be on the container.

5. STORAGE AND COMPATIBILITY

1. At no time should there be more than 55 gallons of waste allowed to accumulate in any area prior to pickup. At no time should there be waste stored over drains or in the sinks. Waste must be stored in a secure place, where it is always under the control of lab personnel. Waste stored outside the lab must be stored in the immediate vicinity of the laboratory or work area, kept behind lock and key, inspected, and kept in a clean location. Waste should not be stored with "good" chemicals. You must store only compatible wastes together in same containers as waste chemicals are accumulated.

6. The examples below are for **incompatible wastes**:

1. ELEMENTAL METALS/HYDRIDES AND ACIDS/ALCOHOLS
CYANIDES AND ACIDS
SULFIDES AND ACIDS
OXIDIZERS AND FLAMMABLE
ACIDS AND BASES
ACIDS AND FLAMMABLE
ACIDS AND CHLORINE COMPOUNDS
AMINES AND CHLORINE COMPOUNDS
WATER OR AIR REACTIVES AND ANYTHING
PHENOL AND FORMALDEHYDE
2. This list is not all inclusive if in doubt do not mix! You should always consult the Material Safety Data Sheet (MSDS) or other chemical information sources for compatibility information. Halogenated (chlorinated) and mercuric waste chemicals should be kept separate from non-halogenated wastes. Acid waste must be kept separate from basic waste.

7. DISPOSAL OF CHEMICALS

1. Waste generated from labs in Smith, SRL and Williams Halls are to be stored in the Waste Storage room located off of the Williams Hall loading dock for pick up. Waste generated in labs located in Cunningham Hall are to be stored in the Waste Storage Room in Cunningham A basement. Wastes from the LCM Building are to be kept in the generating lab until picked up by the waste hauler. Call Jim Dunlap, ext. 2333 when you have a full container of waste to arrange for pick up.

8. SAFETY

1. When handling hazardous waste take extreme care to ensure personal safety and to prevent spills and accidents. Small spills of known materials should be immediately taken care of by personnel in the labs or work areas. If the spill involves a hazardous waste the debris and clean up materials will be a hazardous waste also.
9. **For large spills** the Department Chemical Hygiene Officer, Department Safety Officer and the Manager, Laboratory Safety (Tom Bialke, 4996) should be called.
1. If the spill occurs after hours/weekends/holiday, call 911 from any campus phone.
 2. If the spill or release involves a dangerous or potentially dangerous material then evacuate the immediate area, shut all doors and window if possible, and call 911 from any campus phone. You should stay on the line until told to hang up by the KSU Dispatcher. Persons involved with the problem should remain in the area at a safe distance away to provide information on the materials involved and procedures going on in the area.

10. HAZARDOUS WASTE MINIMIZATION

1. Federal and State law requires that all generators who create hazardous waste come up with strategies to cut both the volume and toxicity of their wastes. Strategies to minimize the waste that your area generates are:

2. **Substitution** - replacing toxic or other hazardous materials used in processes with less or non-hazardous substances. This is the best way to minimize your hazardous waste responsibilities. Example: using Alconox instead of sulfuric/chromic acid glass cleaners.
3. **Micro Chemistry** - using minute quantities and small scale chemistry instead of large amounts of chemicals in laboratory experiments.
4. **Redistilling** - reclaiming solvents for reuse by a distilling process in the laboratory. This also is a great way to cut costs as you cut the cost of replacement solvents drastically.
5. **Recycling/Redistribution** - chemicals that are unused or unopened can often be redistributed to other labs or work areas for reuse saving both disposal costs and new product costs for someone else.
6. **Laboratory Destruction** - Some chemicals can be neutralized or made exempt from hazardous waste regulations by treatment or alteration in the laboratory. This **must** be done as part of the experiment and **must** be done according to published, recognized methods. An example of lab destruction would be neutralizing of strong acids or bases with a buffering solution as part of an experiment that required or created such materials.
7. **Sink Disposal** - Chemicals **NEVER** should be put down the drain because of safety concerns and the problems the chemical may cause at the City of Kent waste water treatment plant. If you have a chemical that you think can be safely disposed of down the drain, call Tom Bialke, 4996 to obtain authorization.