

# HAZARDOUS WASTE - DISPOSAL METHODS

The moment you open and use a can of solvent you are a waste generator. The improper disposal of even small quantities may cause unforeseen problems. Chemicals dumped in the back yard will filter down to the water table. It might take years, but they will eventually pollute that water below. Some chemicals washed down the drain produce flammable vapors which can collect in stand pipes and explode.

Under federal regulations anyone generating less than 1,000 kilograms of waste chemicals per month is considered a small generator and may dispose of waste in common garbage which is taken to a municipal land fill or a waste facility. It is more likely, however, that the laws in your state are more restrictive. To find out, call the local health department, sewage disposal system, or a waste management company. Kansas, Missouri, New Hampshire, New Jersey, South Carolina and Vermont currently exempt only 100 kilograms per month. Minnesota has proposed rules to exempt 100 kilograms per month. California, Rhode Island and Louisiana are unusual because they have no small generator exemption and any quantity of waste must be handled according to the hazardous waste system.

## Disposal Methods:

- Most chemicals may not be put into the sewage system. Untreated bleaches (oxidizers) can react with organic material in the sewers. Sodium chlorate, for example, when mixed with automobile brake fluid will burst into flames in 30 seconds. Solvents, heavy metals, poisons and strong acids and bases can damage a sewer system.
- Many chemicals must be handled as though they retain their original strength.
- Some classes of chemicals may be neutralized and then disposed of down the drain with large amounts of water. Only persons familiar with the chemistry of neutralization reaction should attempt to neutralize their waste.
- Some chemical waste may not be disposed of in common garbage. Oxidizers can react with organic waste in the garbage truck and spontaneously combust.
- Disposing of waste solvents, paints, varnishes or other chemicals in the back yard or in an empty lot is against federal law. If caught, severe fines or a jail sentence may be imposed.
- Burning waste solvents is illegal. Some chemical compounds (most notably chlorinated hydrocarbons) form very persistent intermediate products when incinerated. These can compound air pollution problems and can be toxic.
- It is legal to allow small amounts of waste solvent to evaporate. After all, solvent evaporates whenever a varnish film is allowed to dry. When evaporating small amounts of waste, use a fume hood or equivalent. Be mindful of fire and health hazards.
- Some large generators of waste are able to recycle their waste materials. This solution does not apply to the small quantities of mixed waste produced by conservators.
- Waste which cannot be disposed of through an in-house method should be collected and containerized for removal from the lab.

Hazardous waste can be broadly grouped into chemical classes. These classifications are: solvents (including paints and varnishes), detergents, acids and alkalies, bleaches and ethyl ether. As a general rule these classes should not be mixed together in a waste container. The possibility of chemical reaction between incompatible materials is a genuine fire and safety hazard.

## Solvents

Solvent present a known fire and health hazard and also present disposal and storage problems. Included in this category are: paint, varnish and polymer residues, as well as true solvents like toluene and naphtha. Solvent waste should be collected in glass bottles. Glass is inert and unlike metal, will not rust through if water is mixed in with the waste. Dumping even water soluble solvents down



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the drain is not an acceptable practice as flammable vapors can collect in traps and stand pipes creating a fire hazard.

## Detergents

Only detergents can be safely and legally disposed of down the drain without prior treatment. With the exception of triethanolamine, sewage plants are designed to accommodate this waste. Triethanolamine should be disposed of as the waste solvents are. Do not collect this material in a metal can if it has been mixed with water.

## Acids and Alkalies

Acids and Alkalies may be disposed of in the sewer system under certain conditions. If the acid or base does not contain dissolved heavy metals, it may be neutralized and then washed down the drain with plenty of water. If neutralization is possible, protective gear should be worn during the process. Acids can be neutralized with sodium bicarbonate (baking soda) or sodium carbonate (soda ash). Alkali can be neutralized with acetic acid (vinegar).

Waste containing dissolved heavy metals should not be disposed of in the sewer system under any conditions. Metals such as copper, zinc, lead, cadmium and mercury are toxic and can kill the bacteria which is introduced at the treatment plant to work on the sewage.

## Bleaches

The bleaches should be neutralized before disposal in the sewer system. Many of the bleaches self-neutralize with time.

## Ether

Ether, diethyl ether and ethyl ether all refer to the same material. Petroleum ether (pet ether) is not the same chemical and is handled like the solvents. Ether is dangerous because it is highly flammable and a terrific explosion hazard. Its vapor is heavier than air and creeps along the floor. If it finds an open flame, the fire can flash back to the container. No one should ever smoke or have an open flame near an open can of ether.

As a general rule, ether stored without refrigeration should not be used longer than three months after it is opened. Close attention should be paid to the expiration date on the can. Very old cans of ether often must be disposed of by bomb squads rather than disposal agencies.

To dispose of fresh ether, let it evaporate in a safe fume hood (or equivalent.) For large amounts, contact a disposal firm at once.

Law enforcement agencies train dogs to follow the scent of ether because it is used in the manufacture of PCP. The scent of ether often indicates an illicit drug operation to the authorities.

## Dry Waste

Solid or dry waste should be kept in that state and not mixed in with liquid waste for disposal.

## How To Find Help

Assistance should be available in your area for advice on how to collect, containerize and dispose of hazardous waste. Try looking first in the telephone book for the State Department of Health Services or equivalent, the local fire department, a waste management company or waste hauler. Waste management companies and haulers must be registered with the state and with the Environmental Protection Agency (EPA.) There may be a consultant fee for services rendered.

