

HAZARDOUS CHEMICAL WASTE DISPOSAL

According to Ontario environmental legislation, generators of hazardous waste are responsible for properly packaging and labelling such wastes. The University of Toronto manages the disposal of chemical waste through the Office of Environmental Health and Safety via Environmental Protection Services (EPS). Any questions regarding the disposal of chemical waste should be directed to 416-978-7000.

Chemical waste includes solids, liquids or gases containing or contaminated with any of the following:

- flammable solvents (e.g. acetone, alcohols);
- leachate toxic materials (e.g. heavy metals, pesticides);
- corrosives (e.g. hydrochloric acid, potassium hydroxide pellets);
- reactives such as oxidizers, cyanides, sulphides, explosives, unstable materials and water-reactive materials (e.g. sodium metal);
- toxic materials including mutagenic, carcinogenic, acute or chronic toxic materials (e.g. chloroform, ethidium bromide);
- polychlorinated biphenyls (> 50 ppm concentration);
- non-returnable gas cylinders.

The following waste handling procedures **must** be followed when preparing chemicals for disposal.

Restrictions

1. Only chemical waste generated from laboratory operations will be collected for disposal.
2. **Incompatible chemicals must not be mixed in a single container.**
3. Chemical waste sent for disposal should **not** be mixed with biohazardous or radioactive waste.
4. Solid or liquid chemicals **must not** be mixed with general garbage.



Environmental Health and Safety
For information: 416 978-7000
www.ehs.utoronto.ca

- Liquid chemical waste **must not** be flushed down drains as a method of disposal. This practice is illegal and may lead to dangerous reactions and damage to the drain system as well as create a potential hazard to Facilities personnel working on the system.
- The waste generator bears the primary responsibility for proper packaging and labelling. Any hazardous waste that is improperly packaged or labelled will not be removed.
- If the individual overseeing the collection has any doubts about proper labelling or packaging techniques, the waste will not be removed until he/she is satisfied.
- Waste materials must be labelled and packaged in a manner that will allow them to be stored or transported without the danger of spillage, explosion or hazardous vapours escaping.
- Materials requiring special handling include organic peroxides, PCBs (polychlorinated biphenyls) and explosives. Before disposing these materials, consult Environmental Protection Services at 416-978-7000 or email hazwaste.ehs@utoronto.ca.

WARNING

It is dangerous and illegal to pour hazardous chemicals down drains.

**FOR DISPOSAL USE DESIGNATED WASTE CONTAINERS**

The Office of Environmental Health and Safety
 PHONE (416) 978-7000
 EMAIL hazwaste.ehs@utoronto.ca

Containers

- All containers for storing chemical waste must be properly sealed and undamaged.
- Any container not properly sealed will not be removed (corks or rubber stoppers are not recommended for acid bottles).
- Liquid waste containers should only be filled to 70-80% capacity to allow for vapour expansion and to minimize the potential for spills from overfilled containers.
- Container material must be compatible with the stored hazardous waste (e.g. sharps must be in puncture-resistant containers, hydrofluoric acid cannot be stored in glass containers).
- Promptly dispose of aging containers. Some chemicals are time sensitive and may degrade into very hazardous by-products (e.g. ethers may degrade to form explosive organic peroxides).

Labels

- To prevent the mixing of incompatible hazardous wastes, all materials must be clearly identified by Chemical Waste Labels provided by Environmental Protection Services.

CHEMICAL WASTE	
NAME OF RESEARCHER: <u>DR. KATTA LISZT</u>	
BUILDING <u>Central Lab</u>	
ROOM # <u>1200</u>	PHONE # <u>8-7000</u>
LIST OF CHEMICALS	APPROXIMATE %
<u>Methanol</u>	<u>60 %</u>
<u>Chloroform</u>	<u>5 %</u>
<u>Toluene</u>	<u>35 %</u>
NO SYRINGES, BIOHAZARDS OR RADIOACTIVES	
Special Hazards:	
<input type="checkbox"/> Unstable/Explosive	<input type="checkbox"/> Organic Peroxide
<input checked="" type="checkbox"/> Carcinogen	<input type="checkbox"/> Air or Water Reactive
<input checked="" type="checkbox"/> Other <u>Flammable / Toxic</u>	
WASTE WILL NOT BE REMOVED IF ALL SECTIONS ARE NOT COMPLETED	
For further information call 978-7000	

2. The following information **must** be provided:
 - a) the generic names of the components in the container along with approximate percentages of each component present (no abbreviations or trademark names are to be used);
 - b) the general toxicity and hazard description;
 - c) building name, room number and individual to contact.
3. **If the waste is not properly identified, the containers will not be removed.**

Storage of Waste Chemicals

1. If possible, waste chemicals should be stored in the central waste holding facility on campus located in the shipping and receiving area of the Science Wing (SW111).
2. Waste is to be transported to the central storage area using proper procedures for transporting chemicals.
3. All safety precautions required for the handling and storage of chemicals must also be observed with chemical waste.
4. Waste should be segregated according to compatibility groups such as acids, bases, flammables, oxidizers, and water reactives, and **NOT** according to alphabetical order.

Scheduling Waste Collection

1. The individual in charge of the central waste holding facility is responsible for scheduling the waste collection.
2. If chemical waste is being stored in individual laboratories, it is the responsibility of the laboratory supervisor to schedule a waste collection.
3. Chemical waste collection is arranged through EPS at 416-978-7000.
4. Chemical waste **must not accumulate**. The frequency of collection is dependent on the type and amount of waste generated.

For more information, please go to: <http://www.ehs.utoronto.ca/resources/wmindex.htm>

BIOLOGICAL WASTE DISPOSAL

All laboratories that work with potentially hazardous biological agents and materials, and generate waste containing such agents are responsible for the separation, packaging, and treatment of their laboratory waste prior to its removal and disposal.

For more information, go to: http://www.ehs.utoronto.ca/resources/wmindex/wm5_1.htm

RADIOACTIVE WASTE DISPOSAL

Radioactive waste activities are carried out under a Canadian Nuclear Safety Commission (CNSC) Waste Management Facility licence. All radioactive waste, except liquid scintillation counting vials, is either shipped to a facility for disposal or held for decay. Liquid scintillation counting vials are shipped to a radioactive waste broker.

For more information, go to: http://www.ehs.utoronto.ca/resources/wmindex/wm5_3.htm

SEGREGATION OF CHEMICAL WASTE

Chemical waste should be stored according to the following groupings based on chemical reactivities. Figure 1 may be used to assist in classifying chemical waste. For any waste that cannot be classified according to these groups, Environmental Protection Services should be consulted at 416-978-7000.

Group A – Inorganic Acids and Acid Salts

- a) All inorganic acids (e.g. sulphuric, hydrochloric).
- b) All compounds which do not liberate a gas when acidified (e.g. ferric chloride, sodium sulphate).
- c) Inorganic solids which are inert (e.g. silica).

Note: **Perchloric acid**, although an inorganic acid, is a powerful oxidizing agent and should be included in **Group E**.

Group B – Nitrogenated Bases, Caustics and Acid-Reactive Compounds

- a) Organic and inorganic bases (e.g. amines, sodium hydroxide).
- b) Elements and inorganic salts that may react with acids to liberate gaseous products (e.g. potassium cyanide, ferric sulphide).

Group C – Neutral Organic Solids

- a) All solid organic compounds which are neutral – no acids or bases (e.g. carbon black, styrene).

Group D – Flammable Liquids, Halogenated Solvents and Organic Acids

- a) All organic liquids excluding bases (e.g. toluene, chloroform).
- b) Organic acids (e.g. formic acid, acetic acid).

Group E- Oxidizers

- a) Any inorganic compound may start or increase the intensity of a fire (e.g. hydrogen peroxide, lead nitrate).

Group F – Pesticides

- a) Any compounds used to destroy or inhibit plant or animal pests such as pesticides, fungicides, insecticides, etc.

Group Specials – Water and Reactive Materials

- a) All chemicals which react with air and/or water, including fuming substances (e.g. sodium – a water reactive, phosphorus – an air reactive, lithium aluminum hydride – both air and water reactive, and phosphorus tribromide – fuming substance).

CHEMICAL INCOMPATIBILITIES

When preparing chemical waste for disposal, it is the generator's responsibility to ensure that incompatible chemicals are not stored in the same container. A few general examples are:

- a) Oxidizers (Group E) should never be mixed with reducing agents (e.g. water-reactive chemicals such as sodium) or organic materials (Groups B, C and D).

GROUP E MUST BE KEPT AWAY FROM GROUPS B, C & D

- b) Acid-reactive compounds (Group B) which liberate gaseous products when acidified should not be mixed with any acid (Groups A and E).

GROUP B MUST BE KEPT AWAY FROM GROUPS A & E

- c) Organic acids (Group D) should be segregated from inorganic acids (Group A). Generally inorganic acids are oxidizing agents while some organic acids may be either reducing agents or combustible.

GROUP D MUST BE KEPT AWAY FROM GROUPS A & E

Once the waste has been classified according to their chemical groups, it must be properly segregated to minimize the risk of mixing incompatible groups.

Figure 1: Classification of Chemical Waste for Purpose of Segregation

