

Standard Operating Procedure

Task: Waste Disposal

Date: 5/15/2014

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Background:

- Hazardous waste is generated continuously in a research lab. Procedures for its safe disposal are essential to keeping a lab operating.

Training Requirements:

- Lab safety training
- An understanding of the properties and compatibility of the substances to be disposed of is necessary

Potential Hazards:

- Chemical spill
- Pressure build-up
- Needle sticks
- Cuts from broken glass
- Chemical incompatibility

Special PPE Requirements:

- Face shield for particularly hazardous liquid waste
- Select PPE that is appropriate for the hazard level of the waste stream

Materials Needed:

- 10 L jerrican for hazardous organic waste
- 10 L jerrican for hazardous aqueous waste
- Metal canister for solid waste
- Glass disposal boxes for broken glass
- Sharps container for sharp objects
- Containers for specialized waste streams
- Aqua regia waste

Procedure for disposal of liquid waste:

- Categorize your waste as organic, aqueous, or specialty (see below). Make sure that no traces of pyrophoric or other highly reactive materials remain. Quench as needed before mixing with general waste.
- Open the appropriate jerrican, organic or aqueous, and use a funnel to pour the waste into the container
- Keep the jerricans capped, but not tightly, in order that if pressure builds up it can be vented (**Note:** the jerricans will noticeably expand if pressure builds up)
- **Notes:**
 - Do not mix aqueous and organic waste
 - **Do not mix organic waste with acids**

- **Never mix oxidizing mineral acids such as nitric acid or aqua regia with waste streams that contain organic chemicals. This is an explosion hazard. See aqua regia SOP**
- Consult the (M)SDS sheets of the chemicals to ensure a proper understanding of optimal disposal methods
- Before disposing of the waste make sure that reactive chemicals have been neutralized
- If you are unsure as to the chemical compatibility of a substance consult with the Safety Officer and/or the waste czar; it is best to start a new stream solely devoted to a specific chemical if it is particularly dangerous or it is highly reactive
- When the jerricans reach the 10 L mark, notify the waste czar for the waste to be transferred into the appropriate 20 L carboy (located in the centermost “Flammable” cabinet underneath hood 6). The jerricans will then be placed again in their corresponding hoods.

Procedure for disposal of solid waste:

- Consider your waste: if it contains traces of toxic materials, use a separate stream; if there is a fire risk, quench the materials or leave overnight in a metal container in the back of the hood.
- Make sure solvent has evaporated from paper products (e.g. Kim wipes, filter paper) before disposing of them.
- Use a funnel if pouring powders (e.g. silica, salts) into the waste container; make sure the powder waste is free of solvent before disposing of it.

Procedure for disposal of glass waste:

- **Note:** main laboratory glass waste goes directly to landfill. It is **not** treated as a chemical hazard. Therefore no hazardous chemicals should be disposed in glass waste. If glass is contaminated with a hazardous chemical, either decontaminate before disposal, use the solid waste, or create a dedicated waste container.
- Rinse out any chemicals from the glass before disposing of it.
- Deposit glass waste (pipettes, broken glass, silica plates) into the cardboard boxes located next to each set of two hoods.
- Do **NOT** dispose of gloves, paper products, or any other object other than glass waste into these containers.
- Do not overfill the glass waste container. Seal when it is $\frac{3}{4}$ full.

Procedure for disposal of (non-glass) sharp objects:

- **Note:** main laboratory sharp objects waste goes directly to landfill. It is **not** treated as a chemical hazard. Therefore no hazardous chemicals should be disposed in the sharps container. If a sharp is contaminated with a hazardous chemical, either clean before disposal or create a dedicated waste container.
- Carefully place sharp objects (e.g. disposable syringe needles, razor blades) into a metal solvent drum or an approved plastic sharps disposal container.

Procedure for the preparation of specialized waste streams:

- A specialized waste stream should be generated when the mixture to be disposed of meets the following (non-limiting) criteria: acute toxicity hazard; incompatible with

existing waste streams; unique reactivity hazard (peroxide, pyrophoric, shock sensitive); mixture of phases (solid and liquid mixture).

- In general, specialized waste should be generated when it will be safer to handle a hazardous material on a smaller scale, or when contamination of the larger waste stream is undesired. For example, if the large waste stream contains a toxic metal that needs special handling, all 20 L will need to be treated differently; in that case it is advantageous to only have 1 L of contaminated waste.
- If a separate waste stream is required the waste czar should be notified.
- Empty glass bottles are located next to the back door, by the deuterated solvents. These will serve for specialized liquid waste streams.
- Ziploc bags are located in the shelves across from Poseidon, by the office supplies. These will serve for specialized solid waste streams.
- When generating a specialized waste stream, label it with red tape and a sharpie with the substance identifier clearly written out. Include any warnings you feel may be necessary in the label.
- When a specialized waste stream is ready to be picked up make a list of all the components and notify the waste czar.

Procedures for disposal of other types of waste:

- The disposal of **Aqua regia waste** is covered in the aqua regia SOP.
- Before disposing of **used batteries** cover the terminals with electrical tape. Place them in a Ziploc bag located in the top drawer next to hood 6, by the multireactor. If the bag is full notify the waste czar.
- **Oil waste** is located in the left cabinet underneath hood 6. When the container fills up notify the waste czar.
- Deface **empty solvent drums and then take them** to the loading dock on the ground floor, for crushing.
- Flatten **corrugated cardboard** boxes and take them to the large recycling dumpster by the loading dock.
- Flatten other **cardboard** boxes (e.g. Kimwipe boxes, boxes of gloves) and place them in the paper recycling bin located in the hallway.

References and Related SOPs:

- Aqua Regia SOP
- Cleaning glassware SOP
- Changing pump oil SOP