MERCURY WASTE DISPOSAL

1. SCOPE AND APPLICATION

This SOP describes procedures recommended for the disposal of all high and low-level mercury wastes generated in the Metals and Mercury subsections of the laboratory. These include inorganic mercury (primarily Hg^{2+} in acidic aqueous solutions) and organomercury (primarily methylmercury in organic solvents) wastes.

2. SUMMARY

2.1. Mercury wastes that are generated within the laboratory are environmental pollutants. Their disposal is regulated by the rules that govern industrial dischargers. For the City of Tallahassee, the concentration limit for the disposal of mercury into the city's sewer system is 38 μg/L. ANY waste above 38 μg/L in mercury must be handled as hazardous waste.

2.2. Organomercurials are potent neurotoxins and need to be disposed of properly. Since the toxicity of methylmercury is far greater than inorganic mercury, the thresholds for disposal are much lower (see section 5.3).

3. APPARATUS AND EQUIPMENT

3.1. Large polyethylene carboy (5 L - 25 L)

3.2. Nitrile gloves

3.3. Safety glasses

3.4. Lab coat

Note: All waste containers must be clearly labeled. Inorganic aqueous waste should **NEVER** be mixed with organic waste. Always wear **Nitrile Gloves** while handling high-level organomercury wastes.

4. SAFETY

4.1. Review the Laboratory Health and Safety Plan, located on the Division of Environmental Assessment and Restoration (DEAR) intranet site.

4.2. Use caution with strong irritants such as acids and bases. Avoid breathing the fumes of these irritants by using them in a fume hood and keeping the face away from open containers of these chemicals. Avoid contact with these irritants on skin and clothing by appropriate use of personal protective equipment (PPE) such as gloves, lab coat, face mask, hood shield, etc. Safety glasses and lab coats must be worn at all times in the laboratory.

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5. PROCEDURE

5.1. The aqueous, acidic waste generated during analysis is usually collected in large 25 L polyethylene carboys. The mercury concentration in the aqueous waste is generally below 38 μg/L. The pH of the discharged waste MUST be between 5 to 10 units for release into the sewer system. The lab's lime pit captures and effectively neutralizes residual acid in the waste stream before releasing the waste stream to the sewer. Thus, dilute acidic waste with mercury concentrations below 38 μg/L can be disposed of directly into the sink along with copious amounts of tap water.

5.2. If the aqueous waste mercury concentration is above 38 μg/L:

5.2.1. Treat waste as a hazardous substance by disposing of it in the acid waste room, C217. The key for room C217 must be checked out from the KeyWatcher in room A311. Only designated employees can dispose of hazardous waste in C217. The designated employees are included in the Laboratory's Medical Monitoring Program.

5.2.2. Using gloves, and a respirator if necessary, carefully pour the waste into an available acid waste drum labeled for metals or Hg waste. **DO NOT ATTEMPT THIS ALONE!** Bring one other person as an assistant. This "buddy system" is to ensure that if you are overcome by any vapors released from the waste drums, someone will be there to help you.

5.2.3. Containers may be reused if they are rinsed generously with water. Treat the rinse water as a mercury waste.

5.3. Organic mercury waste:

In general, methylmercury standards are dissolved in organic solvents (isopropanol and acetone). The standards should be disposed of as a metal waste in an organic solvent. **NITRILE GLOVES** must be worn while handling high-level methylmercury waste.

5.3.1. Treat high-level methylmercury dissolved in organic solvent wastes as hazardous. In the laboratory, place the wastes in a clearly labeled container for "Organic Mercury Wastes". **Take precautions to ensure that no inorganic wastes containing oxidizers such as nitric acid are accidently poured into the same container**. When the container is 90 % full, carry the container to the organic waste storage room, C218, and place on a shelf.

5.3.2. When visiting the waste storage room, ALWAYS bring one person with you as an assistant. This "buddy system" is to ensure that if you are overcome by any vapors released from the waste drums, someone will be there to help you. **DO NOT MIX THE METHYLMERCURY WASTE WITH THE CONTENTS OF ANY OTHER DRUM IN THE ROOM.** The clearly labeled methylmercury waste should be placed on the shelf in the organic waste room, C218, away from highly oxidizing chemicals. It

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is collected for disposal as a hazardous waste. **DO NOT REUSE** containers that have been storing high-level methylmercury waste.

5.3.3. Aqueous solutions of methylmercury with concentrations (< 10 µg/L) shall first be oxidized to less toxic total mercury before disposal in the sink. This may be achieved by adding bromine monochloride to the solution and allowing it to stand overnight. Excess bromine shall be reduced by adding hydroxylamine hydrochloride before disposal into the sink, followed by the addition of copious amounts of tap water.

6. REFERENCES

6.1. Material Safety Data Sheets, Fisher Scientific

6.2. ATSDR Mercury factsheet (http://www.atsdr.cdc.gov/toxfaqs/tfacts46.pdf)

6.3. City of Tallahassee, Discharge Restrictions, Sewers and Sewage Disposal (http://talgov.com/Uploads/Public/Documents/you/learn/library/documents/sewer_use_manual.pdf)

6.4. Laboratory Health and Safety Plan, located on the DEAR intranet site.

Appendix of Significant Changes

07/15/2008 Some material was rearranged between Sections 2 and 4. Section 5 on references was added. Other minor revisions to the text were made for format and clarity.

07/15/2009 Added reference to the laboratory's Hazardous Waste Manual.

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