Florida State University
Environmental Health and Safety
LAB GUARDIAN

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Contents:

Why EH&S Requires Your Chemical Inventory

OSHA (Occupational Safety and Health Administration) is a federal regulatory agency under the U.S. Department of Labor whose mission is to "assure the safety and health of America's workers by setting and enforcing standards; providing training, outreach, and education; establishing partnerships; and encouraging continual improvement in workplace safety and health." OSHA requirements for laboratories include many that are familiar to FSU researchers who have attended EH&S training: submission of chemical inventories, labeling of all primary and secondary containers containing chemicals, knowledge of MSDS, and training on general chemical safety and waste disposal.

EH&S assists researchers in complying with these regulations by performing laboratory inspections, providing guidance on chemical and other hazardous

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Acids and Bases: Did You Know?

Both acids and bases can be hazardous to humans and living organisms because of their corrosive properties. The corrosive effect on skin tissue of an acid is dependant on the concentration of the acid. Human contact with dilute acid may only redden the skin tissue, while contact with a concentrated acid for the same duration may cause blistering. Tissue affected by an acid is said to be "burned" because the damage resembles 1st, 2nd, and 3rd degree burns.

- Hydrochloric acid, as well as most concentrated acids, on skin tissue causes a denaturing of the protein.
- Sulfuric acid dehydrates organic materials like sugar, wood, paper, textiles, as well as living tissue.
- Nitric acid causes ugly, yellow burns that are slow to heal at the point of contact. The yellow substance produced is called xanthoproteic acid

The corrosive effect on skin tissue of a base is also dependant on the concentration of the base. Human contact with dilute base may only redden the skin tissue, while contact with a concentrated base may emulsify the skin (make into a thick sticky liquid) at the site of contact. Prolonged exposure to a concentrated base may cause deep wounds that are slow to heal. Concentrated bases corrode skin tissue and can cause clouding of the cornea if in the eyes.

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Acids and Bases

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One of the following procedures may be used to respond to spills of corrosive materials:

- Dilute the material with water with at least ten times the volume released into the environment. This procedure works well when a small amount is spilled.
- Neutralize the corrosive material with an appropriate substance. This procedure is advisable on a large spill since an extremely large volume of water would be needed to dilute the material.

An acid can be neutralized using soda ash or lime. A base can be neutralized with an acidic salt like sodium phosphate or citric acid.

If a corrosive material is splashed into the eyes, the eyes should be flushed with water using an eye wash station for at least 15 minutes or until medical assistance arrives. If the exposed person is wearing contact lenses, flush for a few minutes, remove the lenses, and then proceed with more flushing. If the corrosive material is on the skin, flush with water. If a large portion of the body is affected, use a safety shower. Always rinse for 15 min or until medical assistance arrives. Following flushing with water, an exposed individual should seek immediate medical attention.

Chemical Waste Disposal

Labeling—Remember that all chemical waste must be labeled and the containers kept closed when not in use. Chemical waste containers should be labeled with the words "hazardous waste" and a list of chemical constituents. Failure to identify hazardous waste components may result in fines and follow-up inspections by the Department of Environmental Protection. Contact EH&S Chemical Safety Office (4-7682) for guidance on labeling or to obtain blank hazardous waste labels.

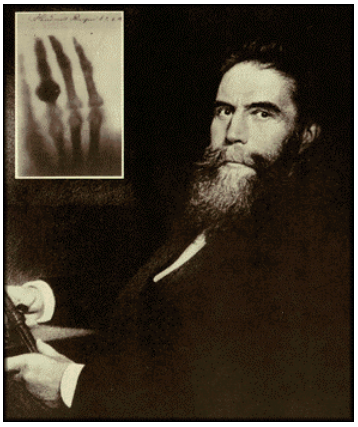
Avoid mixing waste streams—Chemicals with incompatible properties (flammables vs. corrosives) should be collected as separate wastes, unless mixing is required for experimental purposes. Solvent waste which has been made acidic or basic requires special waste handling that increases FSU's waste disposal costs. Further, corrosive and flammable mixes require different waste containers than flammable chemical wastes. Contact EH&S Chemical Safety Office for guidance on waste collection and to obtain appropriate waste containers.

Chemical Inventories *(continued from page 1)*

materials, providing annual training, and disposing of hazardous substances. Chemical Inventories, including chemical name, approximate maximum amount stored, and chemical location (building and room number) may be prepared and e-mailed to labsafety@admin.fsu.edu or sent by campus mail to MC 4191. The use of EH&S Chemical Inventory forms are not required, but may be downloaded from www.safety.fsu.edu/forms.html. EH&S will ask for annual updates to the chemical inventory. For many labs, this will simply require a review of chemicals on hand and the addition of a few or several dozen chemicals. For additional information, please contact Janice Dodge at 644-8916 or Renee Murray at 644-7682.

Wilhelm Conrad Roentgen (1845-1923)

We exist in an environment that contains many naturally occurring radioactive elements and naturally produced radiation. These sources of ionizing radiation have always existed; they come from the decay of terrestrial radioactive isotopes as well as being constantly produced by cosmic sources. However, we did not become aware of the existence of these until just before the turn of this century, when several pioneering researchers began making key discoveries. Their research, and their influence on the research of others, would lead to an exponentially increasing understanding of fundamental nuclear processes, and initiated a vast, still ongoing interdisciplinary research effort from which we are still benefiting. These principal discoveries paved the way for the use of radioisotopes and radiation in ways that affect many aspects of our everyday lives. The first of these discoveries was made by Wilhelm Conrad Roentgen, in his laboratory at the University of Wurzburg, on November 8, 1895.



Roentgen discovered ionizing radiation when he noticed that a relatively common cathode ray (electron) producing device, with which he was experimenting, caused a nearby fluorescent screen to glow. He determined that the stimuli for the fluorescence were byproduct emissions from the apparatus that had never before been noticed and he named them "x-rays". He studied these emissions for two months before reporting them to his colleagues. During that short time, he not only verified his findings but also produced the first x-radiographs, including the one of his wife's hand which is inset in his photograph. Roentgen discovered that radiation existed, validated the basic means by which we produce x-rays today, and essentially performed the first human diagnostic application, the latter of which would get him in "hot water" in today's research and regulatory climate. He was awarded the Nobel Prize for this discovery in 1901.

Although Roentgen was a professor and lived comfortably for most of his life, he is said to have died a rather poor man. Dr. Roentgen was very humble and generous, donating all of the Nobel Prize money, about $41,800 US equivalent in 1901, to his university. He refused to accept a title of German nobility "Von Roentgen", and refused to patent his discovery so that further studies of this finding could be done unhindered. Without this discovery, many people would not be alive today; directly and indirectly this discovery greatly improved the overall health and well-being of all mankind. Henri Becquerel , Marie Curie and Ernest Rutherford made subsequent discoveries that continued this initiative and will likely be covered in future articles. The movie “Madame Curie”, made in 1943 about Pierre and Marie Curie, starring Greer Garson and Walter Pidgeon and written by Eve Curie and Aldous Huxley, seems to stay very true to the historical account of the events and is worth watching if you ever have the opportunity.

Why spend valuable research time in safety training?

The Florida State University EH&S staff strive to promote a safe workplace. Training is one of the most effective methods of conveying safety information to employees and advising them of regulatory requirements. Environmental Health and Safety staff work to provide relevant safety training, as well as training that complies with federal and state laws. Whenever possible, EH&S combines several types of required training into one class or course. Additionally, training that is required annually to comply with state or federal law is usually offered as a short refresher class after the first session. The following training classes are offered routinely to the target audiences listed:

Required EH&S training for **ALL researchers** (professors, post-docs, grad students, lab technicians, DIS students, OPS researchers, other laboratory workers with potential exposure to chemicals or other hazardous materials):

- Hazard Communication/Chemical Safety/Hazardous Waste Disposal/Lab Safety – one class given annually covers these topics — contact Renee Murray 4-7682 or Janice Dodge 4-8916 for information.

Required Training for listed groups:

- Radiation Safety – required for researchers intending to work with radioactive materials. Repeat attendance every 7 yrs — contact Jason Johnson 4-8802
- Bloodborne pathogens (BBP) – required annually for researchers working with human or simian blood or with human pathogens (HIV, HBV, HCV, etc.) — contact Richard Le 4-5374
- Biomedical waste – required annually for researchers disposing of biohazardous or biomedical materials (not including red sharps boxes) — contact Richard Le 4-5374
- Biosafety for BSL2 work or for special issues involving biohazards or infectious materials – required before working with biohazardous materials — contact Richard Le 4-5374
- Animal allergens – for researchers working with animals—required prior to animal contact — training given by CD — contact LAR 4-4262
- Halothane safety – required prior to halothane use in research—contact LAR 4-4262

Optional EH&S Training offered to researchers and others:

- New Researcher—training for new lab workers, may be given on request— contact Janice Dodge 4-8916
- Specific hazards (cryogenics, electrical safety, shop safety, etc.) – given as needed —contact Janice Dodge 4-8916
- Adult CPR training—offered on a limited basis to researchers and research support staff — individuals are certified in Red Cross Adult CPR. Retraining annually is required for continued certification — contact Amy Hicks 4-9117

Required In-lab Training

Principal Investigators and Lab Managers are responsible for providing hazard-specific training to students and employees on an ongoing basis. The OSHA laboratory standard 1910.1450(f)(1) requires that

"The employer shall provide employees with information and training to ensure that they are apprised of the hazards of chemicals present in their work area."

Direct Pick-up of Biohazardous Waste

In order to better serve the needs of the University, the Biological Safety Office has begun direct pick-up of all biohazardous waste. The biohazardous waste bins located at Biology Unit One, College of Medicine, and Conradi will no longer be available. For biohazardous waste pick-ups, call the Biological Safety Office at 644-5374 or 644-9117. As always, you can request a pick up online at http://www.safety.fsu.edu/biopic_form.html. If you have any additional questions, please contact the Biological Safety Office.

Use of Sharps Boxes

The biohazard red sharps box should only be used for the disposal of razor blades, syringes, scalpels, and needles. Call the Biological Safety Office for pickup.

Non-contaminated glassware and glass sharps, such as fixed slides, pipettes, and broken and empty rinsed laboratory glassware, must be collected in a cardboard box lined with a garbage bag. Label the box "**BROKEN GLASS**" or "**SHARPS"**. When the box is approximately 3/4 full, it should be closed, taped, labeled "sharps trash" or "broken glass" and discarded as general trash. Keep in mind that the box should not be too large or heavy to carry when full.

Laboratory Refrigerator and Freezer Disposal

Policy on surplus or disposal of laboratory refrigerators and freezers: departments should make every effort to transfer unused laboratory equipment, including refrigerators and freezers, to other researchers for continued laboratory use (remember to decontaminate, and to call Radiation Safety to check for radioactivity). Refrigerators and freezers should not be sent to Property Surplus, as the potential for transfer to the public through University auctions is high. If purchased by the public, it is likely that refrigerators and freezers that once held chemicals or specimens would be used for food storage.

If no laboratory use can be found and a refrigerator or freezer must be discarded, Maintenance should be contacted to remove the freon and take off the door, and the unit should then be disposed of as solid waste. Form AR212, a Controller's form used strictly for items to be removed from a budget but not actually transferred to property surplus, should be filled out and sent to Property Records MC 2393. AR212 may be downloaded from the Property section of the Controller forms website.

Office or break room refrigeration units may be sent to Surplus Property. Property Change form PC 123 should be submitted for property that is transferred to Surplus Property. Please contact the Laboratory Safety Office, 644-8916, for further information.

Radiation Safety Personnel Changes

The Radiation Safety Office has undergone some recent changes. Former Radiation Safety Coordinator, Paul Burress, is now the Assistant Director for EH&S Research Support. Jason Johnson was promoted to Coordinator, and a new Senior Health Physicist, Nicole Lilly has joined the team. She has a Master's in Microbiology and comes to FSU from Delaware where she just completed an Emerging Infectious Diseases (EID) Fellowship at the Delaware Public Health Department. We in Research Support are fortunate to welcome such great talent.

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Lab Safety Support

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	Andrew Davis	644-0818	akdavis@admin.fsu.edu
Radiation Safety	Jason Johnson	644-8801	jajohnson@admin.fsu.edu
	Nicole Lilly	644-8802	nlilly@admin.fsu.edu
NHMFL Safety	Angela Sutton	644-0311	sutton@magnet.fsu.edu

www.safety.fsu.edu

Lab Safety Reminders

- OMNI ordering glitch—Recent shipments of hazardous materials or controlled substances routed through EH&S have arrived with paperwork devoid of lab destination information. PO's also do not always show the lab destination when the "ship to" address is EH&S. When ordering hazardous materials or controlled substances, please list the lab or PI name on the purchase order by entering it in the note field. The "ship to" code is SRSF106 for controlled substances
- Hazardous materials outgoing shipments—Remember to contact EH&S before shipping hazardous materials (chemical, biohazardous or radioactive materials). EH&S will provide guidance to ensure compliance with federal and state regulations for shipping.
- Animal Researchers must enroll in the Vertebrate Animal Medical Monitoring program through EH&S. Researchers who have enrolled in the Medical Monitoring program but previously declined free medical procedures offered to them may request those procedures. For information, call Amy Hicks 4-9117.
- Moving your lab? Contact EH&S for guidance and assistance prior to moving using the contact information above or contact Janice Dodge for information.
- Weighing dry chemicals—A chemical exposure can readily occur when weighing chemicals, either through spilling dry chemicals and transferring them to other surfaces, or by inhaling chemical "dusts" that arise from pouring finely powdered substances. Chemicals like acrylamide or phenylmethylsulfonylfluoride are easily made airborne when measuring the dry chemical while preparing standard solutions. Lab personnel should be trained on protective measures required for avoidance of exposure, including the use of lab coats, gloves, safety goggles and dust masks. Additonally, labworkers should be supervised during these and all hazardous operations.
- Centrifuge locks/guards—OSHA requires that centrifuges must be "designed and constructed so as to prevent the operator from having any part of his body in the danger zone during the operation cycle". Centrifuges without locks may not fully comply with OSHA regulations. Additionally, centrifuges must be stable and balanced when in use. Clinical and tabletop centrifuges should not be positioned on unstable surfaces (stools, chairs, carts or shelving units). Contact Janice Dodge 4-8916 for information.
- Nanoparticles may be more toxic than other molecular structures. Of especial note is the probable toxicity of carbon nanotubes. A brief overview and links to toxicity information appear on the cdc website — www.cdc.gov/niosh/topics/nanotech