

Laboratory Standard Operating Procedure: Carcinogens

I.	THIS STANDARD OPERATING PROCEDURE (SOP) IS FOR A:
<p><input type="checkbox"/> Specific laboratory procedure or experiment <u>Examples:</u> synthesis of chemiluminescent esters, folate functionalization of polymeric micelles, etc.</p> <p><input type="checkbox"/> Generic laboratory procedure that covers several chemicals <u>Examples:</u> distillation, chromatography, etc.</p> <p><input checked="" type="checkbox"/> Generic use of specific chemical or class of chemicals with similar hazards <u>Examples:</u> organic azides, mineral acids, etc.</p>	
<p>This standard operating procedure (SOP) is intended to provide general guidance on how to safely work with carcinogenic materials. This general use SOP only addresses safety issues specific to carcinogenic hazards of chemicals. In some instances, several general use SOPs may be applicable for a specific chemical (i.e., for benzene, both general use SOPs for flammables and carcinogens would apply). If you have questions concerning the applicability of any item listed in this procedure contact the Principal Investigator/Laboratory, Supervisor of your laboratory or the Chemical Environmental Health and Safety Coordinator [CEHSC] at (813) 842-3528.</p>	
II.	CLASS OF HAZARDOUS CHEMICALS
<p>A carcinogen is a substance or agent that meets one of the following criteria:</p> <ol style="list-style-type: none"> 1. It is regulated by OSHA as a carcinogen. 2. It is listed under the category, "known to be carcinogens" in the Annual Report on Carcinogens published by the National Toxicology Program (NTP's most recent edition); or 3. It is listed under Group 1 ("carcinogenic to humans") by the International Agency for Research on Cancer (IARC) 4. It is listed in either Group 2A or 2B by IARC or under the category, "reasonably anticipated to be carcinogens" by NTP, and causes statistically significant tumor incidence in experimental animals in accordance with any of the following criteria: <ol style="list-style-type: none"> a) After inhalation exposure of 6-7 hours per day, 5 days per week, for a significant portion of a lifetime to dosages of less than 10 mg/m³; b) After repeated skin application of less than 300 mg/kg of body weight per week; or c) After oral dosages of less than 50 mg/kg of body weight per day. 	
III.	GENERAL HAZARD CONTROL
<p>Laboratory specific SOPs will vary according to the material used and detail of experimentation techniques. The following guidelines are to be applied as a general precaution for projects involving carcinogens:</p>	

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- 1) Use the smallest amount of chemical that is consistent with the requirements of the work to be performed.
- 2) Use containment devices (such as lab fume hoods or glove boxes) when:
 - a) Volatilizing these substances,
 - b) Manipulating substances that may generate aerosols, and
 - c) Performing laboratory procedures that may result in uncontrolled release of the substance.
- 3) Use high efficiency particulate air (HEPA) filters, carbon filters, or scrubber systems with containment devices to protect effluent and vacuum lines, pumps, and the environment whenever feasible.
- 4) Use ventilated containment to weigh out solid chemicals. Alternatively, the tare method can be used to prevent inhalation of the chemical. While working in a laboratory hood, the chemical is added to a pre-weighed container. The container is then sealed and can be re-weighed outside of the hood. If chemical needs to be added or removed, this manipulation is carried out in the hood. In this manner, all open chemical handling is conducted in the laboratory hood.

IV.

ENGINEERING & VENTILATION CONTROLS

Carcinogenic chemicals should be used in lab fume hoods or a well-ventilated area. When used in larger quantities (> 500mL) or when using above room temperature and/or pressure fume hoods are mandatory. If the process does not permit the handling of large quantities of carcinogens in your fume hood, contact the CEHSC at 813-840-3528 to request ventilation review. Lab ventilation should have a minimum of 6 air changes per hour.

NOTE: Certain carcinogens are also considered particularly hazardous substances (i.e., benzene) and may require use of fume hood due to the flammables potential.

FOLLOW SAFE FUME HOOD PRACTICES:

1. Ensure the fume hood's certification date is within a one-year period. Verify sufficient inward airflow before using a hood by checking the hood's airflow indicator. Report any problems to PI/Lab Supervisor and the CEHSC.
2. Maintain hood sash at or below the maximum height indicated by an arrow on the side of the fume hood.
3. Close the hood sash when not working in the hood.

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4. Avoid rapid movements at the face of the hood to avoid creating competing air currents that reduce the ability of the hood to contain air contaminants.
5. Equipment used in hoods should be placed securely on blocks to allow air to flow under and around the equipment.
6. Keep chemical sources and equipment at least six inches away from the face or rear of the hood.
7. Minimize equipment and chemical storage placed in the hood to avoid dead air spaces or eddies and to prevent blocking back baffles.

V.

PERSONAL PROTECTIVE EQUIPMENT

☒ Lab Coat ☒ Long pants ☒ Close-toed shoes ☒ Safety glasses

The above listed personal protective equipment should be worn when handling highly reactive or unstable substances. Additional protection may be required based upon each chemical agent.

Check all personal protective equipment [PPE] prior to use to ensure good undamaged condition. At a minimum:

1. When handling hazardous chemicals or contacting potentially contaminated surfaces, protective gloves are to be worn. For proper selection of glove material, review [chemical MSDS](#) and [glove selection guidance](#).
2. Goggles (not safety glasses) are appropriate for processes where a splash or spray potential exists.
3. Additional protective clothing (i.e., face shield, apron, and oversleeves) is appropriate for chemicals that are toxic through skin contact or dermal absorption.

VI.

SPECIAL HANDLING PROCEDURES AND STORAGE REQUIREMENTS

Ensure secondary containment and segregation of incompatible chemicals per guidance within the [UT Chemical Hygiene Plan](#). Also, follow any substance-specific storage guidance provided in SDS documentation.



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VII.	DESIGNATED AREA
<p>For use of carcinogens, a designated area shall be established where limited access, special procedures, knowledge, and work skills are required. A designated area can be the entire laboratory, a specific laboratory workbench, or a laboratory hood. Designated areas must be clearly marked with signs that identify the chemical hazard and include an appropriate warning; for example: WARNING! FORMALDEHYDE WORK AREA – CARCINOGEN..</p>	
VIII.	EMERGENCY SPILL AND ACCIDENT PROCEDURES
Health-Threatening Emergencies Examples: Fire, explosion, health-threatening hazardous material spill or other Immediate Danger.	<ol style="list-style-type: none">1. Call 9112. Alert people in the vicinity to evacuate3. Activate the local alarm systems4. Call Campus Security at 813-257-7777 or xtn. 77775. Remain nearby to provide arriving emergency responders information about chemicals6. Once personal safety is established, call the CEHSC at (813) 842-3528
Personnel Injury or Exposure	<ol style="list-style-type: none">1. Remove the injured/exposed individual from the area if it is safe to do so because of the medical condition of the victim or the potential hazard to rescuers.2. Call 9113. Administer first aid as appropriate.4. Flush contamination from eyes/skin using the nearest emergency eyewash/shower for a minimum of 15 minutes.5. Remove any contaminated clothing to prevent contaminants from continuing to absorb onto skin.6. Give medical responders copies of SDSs for all chemicals the victim was exposed to.7. Report the exposure to the CESHSC
Non-Health Threatening Emergencies	Call Security at 813-257-7777 or xtn. 7777 to report incident
Small Spill Clean-Up	<p>Note: Only minor spills or releases can be cleaned up by knowledgeable personnel using readily available equipment:</p> <ol style="list-style-type: none">1. Notify personnel in the area and restrict access. Eliminate all sources of ignition.2. Review the SDS for the spilled material, or use your knowledge of the hazards of the material to determine the



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	<p>appropriate level of protection.</p> <ol style="list-style-type: none"> 3. Wear gloves and protective eyewear. Clean up using absorbent. Put the contaminated absorbent in a labeled hazardous waste container. 4. If greater than 30 ml, or if it will take longer than 15 minutes for you to clean-up, immediately call Security (813) 257-7777 or xtn. 7777 to report the spill, and notify your supervisor. 5. Submit waste pickup request to the CEHSC.
Incident Reporting	<ol style="list-style-type: none"> 1. Report all occupational injuries or illness to laboratory supervisor as soon as practical. 2. Laboratory personnel are encouraged to report "near misses" as they are considered a precursor to actual incidents. 3. Laboratory supervisor is to conduct (or coordinate) an investigation of all incidents and "near misses." The goal of the investigation is to identify and address any deficiencies that may have contributed to the incident.
Medical Consultation	<p>Laboratory personnel who work with hazardous chemicals are to be provided the opportunity to receive medical attention/consultation when:</p> <ol style="list-style-type: none"> 1. A spill, leak, explosion or other occurrence results in a hazardous exposure (potential overexposure). 2. Symptoms or signs of exposure to a hazardous chemical develop.
IX.	WASTE DISPOSAL
<p>Carcinogens intended for disposal are considered hazardous wastes. Please call the CEHSC at (813) 842-3528 to Describe the quantities of waste you anticipate generating and appropriate waste disposal procedures. Include any special handling or storage requirements for your waste..</p>	
X.	DECONTAMINATION PROCEDURES
PERSONNEL	<p>Immediately after working with carcinogens, remove gloves, wash hands and arms with soap and water.</p> <p>If immediate medical attention is required, call 911. Remove any contaminated clothing, and IMMEDIATELY flush contaminated skin with water for at least 15 minutes following</p>



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	<p>any skin contact. For eye exposures, IMMEDIATELY flush eyes with water for at least 15 minutes.</p> <p>Consult SDS for guidance on appropriate first aid. Where medical attention is required, ensure to bring along SDS(s) of chemical(s) to aid medical staff in proper diagnosis and treatment.</p>
AREA	<ol style="list-style-type: none">1. Decontamination procedures vary depending on the material being handled; consult the SDS.2. Some materials can be neutralized with other reagents.3. All surfaces should be wiped with the appropriate cleaning agent following dispensing or handling. <p><i>Note: Waste materials generated should be treated as a hazardous waste.</i></p>
EQUIPMENT	<p>Decontaminate laboratory apparatus or other contaminated equipment (glassware) before removing them from the designated area.</p>
XI.	TRAINING REQUIREMENTS
<p>General Training (check all that apply):</p> <ul style="list-style-type: none"><input checked="" type="checkbox"/> General Safety & Emergency Preparedness – Annual Orientation Training<input checked="" type="checkbox"/> Review of MSDS for other chemicals involved in process/experiment<input checked="" type="checkbox"/> Compressed gas safety<input checked="" type="checkbox"/> Review of this SOP<input type="checkbox"/> Other: _____ <p>The University may require additional safety training depending on the hazardous materials and laboratory-specific processes – consult the PI for more information.</p>	