STANDARD OPERATING PROCEDURE – PYROPHORIC CHEMICALS

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| **CONTACT INFORMATION** | | | |
| **Location** | Building: | | Room: |
| **Street Address:** |  | | |
| **Lab Safety Contact:** | Name: | | |
| Lab Phone: | Office Phone: | |
| **Emergency Contact** | Name: | Phone: | |
| **TYPE OF STANDARD OPERATING PROCEDURE** | | | |
| Indicate which type of Standard Operating Procedure applies  Specific Process or Equipment  Specific Hazardous Chemical  Hazard Class for a Group of Chemicals: Pyrophoric Chemicals | | | |
| **DESCRIBE PROCESS/EQUIPMENT, HAZARDOUS CHEMICAL or HAZARD CLASS** | | | |
| Pyrophoric chemicals are used in research to catalyze certain reactions and often are incorporated into final products. A pyrophoric material is defined by the National Fire Protection Agency (NFPA) as having an autoignition temperature below 130◦ F (55◦ C). A pyrophoric material is one which reacts with air, in the absence of external energy, to produce heat. These materials typically also react violently with water. Because of this, pyrophoric materials must always be handled under inert atmosphere. Examples: Alkylated Metals, Phosphorous, Metal Hydrides. | | | |
| **HAZARD SUMMARY** | | | |
| Pyrophoric chemicals will ignite spontaneously in the presence of oxygen and/or water. They must have limited to no exposure to the atmosphere. Exposure of these reagents to air could result in spontaneous ignition that could cause burns or other injuries to the person handling the reagent or others in the immediate area. | | | |
| **SPECIAL HANDLING AND STORAGE REQUIREMENTS** | | | |
| Containers of pyrophoric chemicals should only be opened inside a working fume hood or a glove box or bag. Pyrophoric chemicals must have limited to no exposure to the atmosphere. A glove box may be used with pyrophoric material if an inert environment is required or a glove bag in the event a glove box is not available. The lab principal investigator and/or designated safety officer are responsible for ensuring that the user is trained and competent in working with pyrophoric chemicals.  If the potential exists for explosion or a high thermal reaction, additional blast shielding should must be utilized. This may involve the use of shielding in a glove box or in the case of a fume hood with the sash in the lowest possible position. Portable shields may also be used for additional protection.  Store pyrophoric material away from heat/flames, oxidizers, water sources, and normal oxygen atmosphere environments if outside of the manufacturer- provided container. Keep containers closed and ensure that manufacturer's labels and warnings remain intact. Check the SDS for incompatibilities when storing pyrophoric chemicals. | | | |
| **ENGINEERING AND VENTILATION CONTROLS** | | | |
| Work under an inert atmosphere (e.g., argon, nitrogen) using a Schlenk line, in a glove box, vacuum manifold, or any enclosed inert environment. If procedure is done in the fume hood, use the sash as a safety shield. For hoods with a horizontal sliding sash, position the sash all the way down, stand behind the sliding windows and reach around to perform the manipulations required. For hoods with vertical sliding sash, keep the sash as low as possible. Face shields are to be used when there is no protection from the hood sash or when the hood sash is open. Remove any flammables (squirt bottles containing solvents, oil baths) and combustibles (Kimwipes, paper towels) from the work area. Laboratories and rooms where pyrophoric chemicals are used must have general room ventilation that is negative pressure with respect to the corridors and external environment. The laboratory/room door must be kept closed at all times. Locate the nearest fire extinguisher before use. Emergency eye wash fountains and safety showers must be available. | | | |
| **PERSONAL PROTECTIVE EQUIPMENT** | | | |
| **PPE Requirements:**  Long pants or clothing that covers all skin below the waist  Shoes that cover the entire foot  Gloves; indicate type: Gloves must be worn when handling pyrophoric chemicals - flame retardant gloves should be used. Inspect gloves before use, and use proper glove removal techniques to avoid skin contact with outer surface of glove. Wash hands after removing gloves.  Safety goggles: Safety goggles that meet the ANSI Z.87 Standard must be worn whenever handling pyrophoric chemicals.  If the potential exists for explosion or a high thermal reaction, eye/face protection must be worn in the form of goggles in combination with a face shield.  Safety glasses  Face shield, if the potential exists for explosion or a high thermal reaction  Lab coat  Flame-resistant lab coat  Other:  If the use of an N95, half mask, or full-face respirator is requested, the individual and/or their supervisor must first contact Environmental Health & Safety for a consultation to determine if respirator use is necessary. If EH&S determines the use of a respirator is necessary, the individual must participate in the University’s respirator program. This includes a medical evaluation, respirator fit test, and training. | | | |
| **EMERGENCY PROCEDURES** | | | |
| In case of fire or large and/or extremely hazardous chemical releases pull the fire alarm and evacuate the area  If someone is seriously injured or unconscious  **CALL 911 or CAMPUS POLICE AT <enter your campus PD #>**  From a safe place, provide as much information as possible to the emergency responders including chemical name, volume, hazards, injuries, and location. DO NOT use water to put out fire, instead use a Class B fire extinguisher. DO NOT use water to put out fire, instead use a Class B fire extinguisher.  **Chemical Exposure:**  **If inhaled**  If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.  **In case of skin contact**  Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.  **In case of eye contact**  Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue rinsing eyes during transport to hospital.  **If swallowed**  Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.  **Evacuation Procedure**   * Immediately evacuate the building via the nearest exit when the fire alarm is activated. * If unable to evacuate due to a disability, shelter in the area of rescue / refuge, typically a stairwell landing, and wait for assistance from drill volunteers or emergency responders. * Instruct visitors and students to evacuate and assist them in locating the nearest exit. * Do not use elevators to exit the building during an evacuation as they may become inoperable. * Carry only those personal belongings that are within the immediate vicinity. * Close doors to limit the potential spread of smoke and fire. * Terminate all hazardous operations and power off equipment. * Close all hazardous materials containers. * Remain outside of the building until the building is released for reentry. * Do not restrict or impede the evacuation. * Convene in the designated grassy gathering area and await instruction from emergency responders or drill volunteers. Avoid parking lots. * Report fire alarm deficiencies, (e.g., trouble hearing the alarm) to facilities personnel for repair. * Notify evacuation drill volunteers or emergency responders of persons sheltering in the areas of rescue/ refuge. * **Never assume that an alarm is a “false alarm”. Treat all fire alarm activations as emergencies. Get out of the building!**   **Incident and Near Miss Reporting**: Report any incident that occurs in any University of South Florida affiliated teaching or research laboratory/studio or field research project. An incident means any unplanned event within the scope of a procedure that causes, or has the potential to cause, an injury or illness and/or damage to equipment, buildings, or the natural environment. Due to medical privacy concerns, no personal identifying information of the person involved in the incident shall be entered or submitted with the form. <http://www.usf.edu/administrative-services/environmental-health-safety/reporting/index.aspx>  **Workers’ Compensation Procedure:** Call AmeriSys at 800-455-2079 to report a work-related injury or illness. Complete the Supervisor’s Accident Investigation Report available at the link above and send it to EH&S within 24 hours. | | | |
| **WASTE DISPOSAL** | | | |
| All chemical waste generated within USF System laboratories is considered hazardous waste and must be disposed of as hazardous waste in accordance with the USF Hazardous Waste Management Procedure, the U.S. EPA, and the FDEP. The USF Hazardous Waste Management Procedure can be found using the following link, <https://www.usf.edu/administrative-services/environmental-health-safety/documents/hazwaste-managementprocedure.pdf> | | | |
| **TRAINING REQUIREMENTS** | | | |
| All individuals working with chemicals in USF laboratories must take EH&S’s Laboratory Safety Training. To register for Laboratory Safety Training, please use the following link, <https://www.usf.edu/administrative-services/environmental-health-safety/training/course-descriptions.aspx#labsafety>  This procedure may warrant additional safety training per the PI, EH&S, or an authorizing unit such as the Biosafety or Radiation Safety programs. Check training requirements for this activity below:  Research Specific Training from the PI/Lab Supervisor or their designee  EH&S Laboratory Safety Training  EH&S Hazard Communication  EH&S Hazardous Waste Awareness and Handling  EH&S Respirator Fit Test  EH&S Biomedical Waste  EH&S Universal Pharmaceutical Waste Training  EH&S Fire Prevention Safety  EH&S Slips, Trips, and Falls  RIC Biosafety Core Course  RIC Shipping Biohazardous Materials  RIC BSL 3  RIC Radiation Safety  RIC Laser Safety  RIC Boating Safety  RIC Scientific Diving  Other:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | | |
| **PRIOR APPROVALS** | | | |
| This activity requires prior approval from the PI/designee.  If this box is checked, working alone is not allowed. | | | |

By signing and dating here the Principal Investigator or a designee certifies that the Standard Operating Procedure (SOP) for ***Pyrophoric Chemicals*** is accurate and effectively provides safe standard operating procedures for employees and students in this lab who will handle this hazardous chemical.

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Signature Printed Name Date

I affirm that I have read and understand the Standard Operating Procedure for ***Pyrophoric Chemicals*** and have undergone the EH&S Laboratory & Research training and any lab specific training regarding this SOP.

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| Printed Name | Signature | Date |
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