General Use SOP for Flammable and Combustible Liquids

#1	Process or Experiment Description

This standard operating procedure (SOP) is intended to provide general guidance on how to safely work with flammable materials. This general use SOP only addresses safety issues specific to flammability hazards of chemicals. In some instances, several general use SOPs may be applicable for a specific chemical (i.e., both general use SOPs for flammable liquids and particularly hazardous substances would apply to benzene). If you have questions concerning the applicability of any item listed in this procedure contact the Principal Investigator/Laboratory Supervisor of your laboratory or Environmental Health and Safety (x3-0448).

#2	Hazardous Chemicals/Class of Hazardous Chemicals

For the purposes of laboratory safety, both flammable and combustible liquids are considered fire hazards. Flammable liquids have a flash point of less than 199.4 °F (93 °C) and combustible liquids have a flash point above 199.4 °F (93 °C).

#3	Control of Hazards- General

• Do not heat flammable chemicals with an open flame.
• For highly flammable chemicals, avoid static electricity or hot surfaces as they can serve as ignition sources.
• Do not use electrical devices with cracked or frayed electrical wiring.
• When transferring flammable liquid from a bulk container (generally greater than five gallons), the containers must be electrically bonded and grounded.
• Transfer flammable liquids from containers of five gallon-capacity or less inside a laboratory hood (or other area with similar ventilation) to prevent accumulation of flammable concentration of vapors.

#3a	Engineering/Ventilation Controls

Flammable and combustible chemicals should be used in lab fume hoods (or other well ventilated areas) whenever possible, especially when used in larger quantities (> 500mL) or when using above room temperature and/or pressure. If the process does not permit the handing of large quantities of flammable liquids in your fume hood, contact Environmental Health and Safety at x3-0448 to review the adequacy of all ventilation measures.NOTE: Certain flammables that are also considered particularly hazardous substances (i.e., benzene) may require use of a fume hood (due to toxicity potential).

#3b	Personal Protective Equipment

In addition to proper street clothing *(long pants (or equivalent) that covers legs and ankles, and close-toed non-perforated shoes that completely cover the feet)*, wear the following Personal Protective Equipment (PPE) when performing lab operations/tasks involving flammable or combustible liquids:
• Safety glasses (If splash potential exists, use goggles + face shield instead)
• Lab coat (When working with large volumes of flammables (≥1 liter) or heating large volumes of combustibles (≥ 1 liter) near or above their flash point, use a flame resistant lab coat, such as Nomex).
• Appropriate chemical-resistant gloves

#4	Special Handling Procedures and Storage Requirements

Where greater than 10 gallons of flammables are kept, such materials must be stored within a flammable storage cabinet.Fire extinguishers appropriate for the fire hazards present must be available in all laboratories and storage areas. Class D fire extinguishers must be available in the immediate work area when working with flammable metals such as magnesium, sodium, and potassium.
Ensure secondary containment and segregation of incompatible chemicals per guidance within the SU Chemical Hygiene Plan. Also, follow any substance-specific storage guidance provided in MSDS documentation.

#5	Spill and Accident Procedures

Prompt response to chemical spills is critical to protect worker health & safety and to mitigate adverse affects to the environment. For further guidance, refer to "Response to Chemical Spills and Exposures".Laboratory personnel who work with hazardous chemicals are to be provided the opportunity to receive medical attention/consultation when:
• A spill, leak, explosion or other occurrence results in a hazardous exposure (potential overexposure).
• Symptoms or signs of exposure to a hazardous chemical develop.

#6	Waste Disposal

Many flammable liquids intended for disposal may likely be considered hazardous wastes. For general guidance regarding waste disposal, refer to: https://ehs.stanford.edu/topic/waste-disposal

#7	Minimum Training Requirements

• General Safety & Emergency Preparedness (EHS-4200) • Chemical Safety for Laboratories (EHS-1900) • Laboratory-specific training • Fire Extinguisher Use (EHS 3700) – recommended

#8	Approval Required

Consult with PI regarding need for prior approval. Laboratory personnel shall seek and the PI must provide prior approval of any chemical usage involving the following list of restricted chemicals.

#9	Decontamination Procedures

Personnel: If immediate medical attention is required, call x9-911 (or x286 in the School of Medicine). Remove any contaminated clothing, and IMMEDIATELY flush contaminated skin with water for at least 15 minutes following any skin contact. For eye exposures, IMMEDIATELY / flush eyes w/ water for at least 15 minutes.
Consult MSDS for guidance on appropriate first aid. Where medical attention is required, ensure to bring along MSDS(s) of chemical(s) to aid medical staff in proper diagnosis and treatment.
Area: Decontamination procedures vary depending on the material being handled. The toxicity of some materials can be neutralized with other reagents. All surfaces should be wiped with the appropriate cleaning agent following dispensing or handling. Waste materials generated should be treated as a hazardous waste.

#10	Designated Area

For flammables that are also considered particularly hazardous substances, a designated area shall be established per the other applicable SOP(s).