



THE OHIO STATE UNIVERSITY COLLEGE OF BIOLOGICAL SCIENCES
CHEMICAL HYGIENE PLAN
APPENDIX E
SAMPLE STANDARD OPERATING PROCEDURE

(This standard operating procedure is included with permission from the department of Chemistry from their Chemical Hygiene Plan, Revision 4-12-95.)

SOP 1. STANDARD OPERATING PROCEDURE FOR FLAMMABLE LIQUIDS

I. **General Statement of Coverage**

Flammable liquids are chemicals that have a flash point below 100°F (38.7°C) and a vapor pressure that does not exceed 40 psig at 100°F.

II. **Hazard Assessment**

Hazard assessment for work involving flammable liquids should thoroughly address the issues of proper use and handling, fire safety, chemical toxicity, storage, and spill response.

III. **Resources**

- A. Existing Standards
- B. Operating Manual Instructions
- C. Text and Literature References
- D. CHP Appendix IV Chemical Tables
Table 2. Ohio Fire Code

IV. **Chemical Storage**

A. Special Storage

1. The storage of flammable and combustible liquids in a laboratory, shop or building area must be kept to the minimum needed for research and/or operations. If more than 5 gallons of flammables are present outside of safety cans per 100 square feet of area, a flammable liquids storage cabinet is required.
Flammable-liquids storage cabinets are not intended for the storage of highly toxic materials, acids, bases, compressed gases or pyrolytic chemicals.
2. Where feasible (if the quality of the solvent will not be adversely affected) transfer flammable liquids from glass bottles into metal safety cans.

B. Securing Gas Cylinders

V. **Personal Protection Equipment**

A. Eye and Face Protection

Eye protection in the form of safety glasses and side shields must be worn at all times when handling flammable liquids.

B. Eye Wash

Where the eyes or body of any person may be exposed to flammable liquids suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use. Bottle type eyewash stations are not acceptable.

- C. Safety Showers
Safety or drench shower should be available in a nearby location where the flammable liquids are used.
- D. Gloves
Gloves should be worn when handling flammable liquids. The selection of glove materials should be made from Appendix II, Part A of this document. (Chemistry's CHP)
- E. Protective Clothing
Lab coats, closed toes shoes and long sleeved clothing should be worn when handling flammable liquids. Additional protective clothing should be worn if the possibility of skin contact is likely.
- F. Hearing Protection
- G. Respirators

VI. **Controls**

- A. Designated Areas
- B. Chemical Fume Hoods
When possible experiments involving greater than 500 ml of flammable liquids should be carried out in a fume hood.
- C. Glove Boxes
- D. Safety Shielding
Safety shielding is required any time there is a risk of explosion, splash hazard or a highly exothermic reaction. All manipulations of flammable liquids which pose this risk should occur in a fume hood with the sash in the lowest feasible position.
- E. Special Ventilation
Fume hoods provide the best protection against exposure to flammable liquids in the laboratory and are the preferred ventilation control device. Always attempt to handle large quantities of flammable liquids in a fume hood. If your research does not permit the handling of large quantities of flammable liquids in your fume hood, contact the Chemical Hygiene Officer of the Office of Environmental Health and Safety to review the adequacy of all special ventilation.
- F. Vacuum Protection
 1. Evacuated glassware can implode and eject flying glass, and splattered chemicals. Vacuum work involving flammable liquids must be conducted in a fume hood, glove box or isolated in an acceptable manner.
 2. Mechanical vacuum pumps must be protected using cold traps and where appropriate, filtered to prevent particulate release. The exhaust for the pumps must be vented into an exhaust hood. Vacuum pumps should be rated for use with flammable liquids.
- G. Signs and Labels
 1. Doorways
 2. ContainersAll flammable liquids must be clearly labeled with the correct chemical name.
- H. Utilities
- I. File Protection

VII. **Specific Procedures**

VIII. Emergency Procedures

A. Notification

Emergency procedures which address response actions to fires, explosions, spills, injury to staff, or the development of signs and symptoms of overexposure must be developed. The procedures should address the following as a minimum:

1. Whom to contact:
(University police, and Office of Environmental Health and Safety, and Principal investigator of the laboratory including evening phone number)
2. The location of all safety equipment (showers, eye wash, fire extinguishers, etc.),
3. The method used to alert personnel in nearby areas of potential hazards, and
4. Special spill control materials required by the type of flammable liquids handled in the laboratory.

B. Spill Response

1. Anticipate spills by having the appropriate clean up equipment on hand. The appropriate clean up supplies can be determined by consulting the material safety data sheet. This should occur prior to the use of any flammable liquids. Spill supplies for flammable liquids are designed to control the liquid portion of the spill and minimize the production of flammable vapors. Never use paper towels on large spills of flammable liquids because it exacerbates vapor production.
2. In the event of a spill all personnel in the area should be alerted. Turn off all sources of ignition. Do not attempt to handle a large spill of flammable liquids. Vacate the laboratory immediately and call 911 for assistance of the Office of Environmental Health and Safety at 292-1284.
3. Remain on the scene, but at a safe distance, to receive and direct safety personnel when they arrive.

IX. Decontamination and Waste Disposal

A. Decontamination Procedures

1. Personnel
Wash hand and arms with soap and water immediately following any skin contact with flammable liquids.
2. Area
3. Equipment

B. Waste Disposal

Some flammable liquids are hazardous wastes. Question regarding waste disposal should be directed to the Chemical Hygiene Officer and the Office of Environmental Health and Safety.

X. Approvals

XI. SOP Prepared by _____ Date _____
Reviewed by _____ Date _____