APPENDIX A: STANDARD OPERATING PROCEDURES

Each laboratory must write specific standard operating procedures (SOPs) for work involving the use of hazardous chemicals. See the definition of "Hazardous Chemical" in the *Definitions* section of this document. In most cases, more than one SOP will be required. All hazardous chemicals used in the laboratory must be covered by an SOP, and these SOPs must be maintained with the Chemical Hygiene Plan in the laboratory.

There are three methods that can be used to write SOPs:

1. By process (distillation, synthesis, chromatography, etc.).

2. By individual hazardous chemical (arsenic, benzene, hydrochloric acid, etc.).

3. By hazardous chemical class (flammable, corrosive, oxidizer, etc.).

These methods may be used alone or in combination. Two forms are provided (an example and a blank) in this appendix to assist in the preparation of SOPs. The blank form consists of eleven sections and should contain the information listed below. Contact **EH&S** for assistance in developing appropriate SOPs

SOP Format

Sect. 1. Process, Hazardous Chemical, or Hazard Class - circle one.

Sect. 2. Describe Process, Hazardous Chemical, or Hazard Class.

Process - Describe the process, which involves hazardous chemicals. List all chemicals used in the process.

Hazardous Chemical - Name the hazardous chemical for which the SOP is being developed. Include International Union of Pure and Applied Chemistry (IUPAC), common name, and any abbreviation(s) used for the chemical.

Hazard Class - Describe the hazard associated with a particular group of similar chemicals and list the chemicals used in the laboratory.

Sect 3. Potential Hazards - Describe the potential hazards for each process, hazardous chemical or hazard class. Include physical and health hazards.

Sect. 4. Personal Protective Equipment (PPE) - Identify the required level of PPE and hygiene practices needed for each process, hazardous chemical or hazard class. PPE includes: gloves, aprons, lab coats, safety glasses, goggles, face-shields, and respirators. **Note: Before using respirators, all employees must comply with the University's Respiratory Protection Program. Call EH&S for more information**.

Sect. 5. Engineering Controls - Describe engineering controls that will be used to minimize or eliminate employee exposure to hazardous chemicals during the process. This includes ventilation devices such as fume hoods, gloveboxes, etc.

Sect. 6. Special Handling & Storage Requirements - List storage requirements for the hazardous chemicals involved with the SOP, including specific storage areas, and policies regarding access to chemicals. Special procedures such as dating peroxide formers and testing them before distillation are appropriate here.

Sect. 7. Spill and Accident Procedures - Indicate how spills or accidental releases will be handled and by whom. List the location of appropriate emergency equipment (spill kits, showers, eyewashes, and fire equipment). Any special requirements for personnel exposure should also be identified in this section. Identify the location of emergency response phone numbers.

Sect. 8. Decontamination Procedures - Specify decontamination procedures to be used for equipment, glassware and clothing: include equipment such as glove boxes, hoods, lab benches, and designated areas within the laboratory.

Sect. 9. Waste Disposal Procedures - Indicate how wastes will be disposed. Include the name of the person responsible for managing laboratory waste. See also *Appendix B, Handling, Storage and Disposal of Hazardous Materials*.

Sect. 10. Material Safety Data Sheet Location - Indicate the location of MSDSs for each hazardous chemical used. Also, indicate the location of other pertinent safety information, i.e. equipment manuals, chemical references, etc.

Sect. 11. Principal Investigator/Lab Manager Approval – Sign and date to indicate the SOP has been approved.

EXAMPLE SOP

Location: _____ Principal Investigator: _____ Date: _____

Sect. 1. Process, Hazardous Chemical, or Hazard Class - circle one.

Sect. 2. Describe Process, Hazardous Chemical, or Hazard Class: (Hazard Class) Using various concentrations of aqueous acid solutions including nitric, sulfuric, hydrochloric, acetic, phosphoric.

Sect. 3. Potential Hazards: Corrosive material. Can cause severe burns. Routes of entry: Inhalation and skin absorption.

Sect. 4. PPE: Safety goggles, nitrile, PVC, or neoprene gloves. Avoid skin contact, serious burns may result. Wear safety glasses or safety goggles with face shield when using large quantities, or chemical safety goggles when using small quantities. Wear rubber, neoprene, or PVC apron when using large quantities and splash potential exists.

Sect. 5. Engineering Controls: Use concentrated acids in a fume hood. A safety shower and eyewash must be available and accessible when working with corrosive liquids.

Sect. 6. Special Handling and Storage Requirements: Store mineral acids together, separate from oxidizing agents and organic materials. Store acetic and other organic acids separate form mineral acids.

Sect. 7. Spill and Accident Procedures

Skin exposure: Rinse affected skin with plenty of water while removing contaminated clothing and shoes. Rinse for at least 15 minutes. Seek medical attention.

*Eye exposure***:** Splashes may cause tissue destruction. Wash eyes for at least 15 minutes, lifting the upper and lower eyelids occasionally. Seek medical attention.

Small Spills: (Less than 1 qt.) Cover with sodium bicarbonate. When reaction stops pickup with damp sponge or paper towels, and contact **EH&S** to remove the waste from the lab. Do not attempt cleanup if the risk is greater than normal laboratory operations.

Large Spills: Notify others in area of spill. Turn off ignition sources in area. Evacuate area and contact **EH&S**, FAU Police (911) or the emergency responders in the immediate area for spill response. Restrict persons from area of spill or leak until cleanup is complete.

Sect. 8. Decontamination Procedures: Use Sodium Bicarbonate and water.

Sect. 9. Waste Disposal Procedures: Place compatible wastes in a closed, labled container. Dispose of waste through **EH&S**. Refer to FAU Hazardous Material Manual. (see appendix B)

Sect. 10. Material Safety Data Sheet Locations: MSDSs are stored in the CHP binder in the lab.

Sect. 11. Principal Investigator/Lab Manager Approval: Signature:_____

Date:_____

STANDARD OPERATING PROCEDURE

Location: _____ Principal Investigator: _____ Date: _____

Section 1. Process, Hazardous Chemical, or Hazard Class - circle one.

Section 2. Describe Process, Hazardous Chemical, or Hazard Class.

Section 3. Potential Hazards

Section 4. Personal Protective Equipment

Section 5. Engineering Controls

Section 6. Special Handling and Storage Requirements

Section 7. Spill and Accident Procedures

Section 8. Decontamination Procedures

Section 9. Waste Disposal Procedures

Section 10. Material Safety Data Sheet Locations

Section 11. Principal Investigator/Lab Manager Approval:

Signature: _____

Date: _____