

Standard Operating Procedure

ETHANOL

This SOP is not complete until it has been signed and dated by the PI and relevant lab personnel.

Print a copy and insert into your
Laboratory Safety Manual and Chemical Hygiene Plan.
Refer to instructions for assistance.

Department:	Chemistry & Biochemistry – Chemical Engineering
Date SOP was written:	December 14, 2012
Date SOP was approved by PI/lab supervisor:	January 18, 2013
Principal Investigator:	Prof. Susannah Scott
Internal Lab Safety Coordinator/Lab Manager:	Stephanie Goubert-Renaudin
Lab Phone:	805-893-8941
Office Phone:	805-893-7403
Emergency Contact:	EH&S 24 hour line: 805-893-3194
Locations covered by this SOP	ESB 3324, 3328.

Type of SOP: Process Hazardous Chemical Hazardous Class

Purpose

Ethanol is a flammable chemical. If not stored and handled properly, this can pose a serious threat to the health and safety of laboratory personnel, emergency responders and chemical waste handlers. Hence, it is important to follow safety protocols to handle this chemical.

Ethanol is mainly used as solvent. It is miscible with water and with many organic solvents, including acetic acid, acetone, benzene, carbon tetrachloride, chloroform, diethyl ether, ethylene glycol, glycerol, nitromethane, pyridine, and toluene. It is also miscible with light aliphatic hydrocarbons, such as pentane and hexane, and with chlorinated organics such as trichloroethane and tetrachloroethylene.

Physical & Chemical Properties/Definition of Chemical Group

CAS#: 64-17-5

Class: **Flammable**

Molecular Formula: CH₃CH₂OH

Form (physical state): Liquid

Color: no color, clear

Boiling point: 78.4 C

Potential Hazards/Toxicity

Ethanol is **highly flammable** in presence of open flames and sparks, of heat and poses a serious risk of fire.

Slightly explosive in presence of open flames and sparks, of heat, of oxidizing materials, of acids.

CAUTION: MAY BURN WITH NEAR INVISIBLE FLAME Vapor may travel considerable distance to source of ignition and flash back. May form explosive mixtures with air. It ignites and explodes on contact with acetic anhydride + sodium hydrosulfate, disulfuric acid + nitric acid. Addition of alcohols to highly concentrate hydrogen peroxide forms powerful explosives. Explodes on contact with calcium hypochlorite

Potential Acute Health Effects: Hazardous in case of skin contact (irritant), of eye contact (irritant), of inhalation. Slightly hazardous in case of skin contact (permeator), or ingestion.

Potential Chronic Health Effects:

MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. TERATOGENIC EFFECTS: Classified PROVEN for human. DEVELOPMENTAL TOXICITY: Classified Development toxin [PROVEN]. The substance is toxic to blood, the reproductive system, liver, upper respiratory tract, skin, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage.

Personal Protective Equipment (PPE)

Hand Protection

Nitrile or latex gloves have to be worn

Eye Protection

Safety Goggles

Skin and Body Protection

Lab coat

Engineering Controls

Provide exhaust ventilation. Ensure that eyewash stations and safety showers are proximal to the workstation location.

First Aid Procedures

If inhaled

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.

In case of skin contact

Wash with a disinfectant soap. Seek medical attention.

In case of eye contact

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Get medical attention.

If swallowed

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

Special Handling and Storage Requirements**Precautions:**

Keep away from heat. Keep away from sources of heat or ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, acids, alkalis, moisture.

Storage:

Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame). Do not store above 23°C (73.4°F).

Spill and Accident Procedure**Chemical Spill**

Small Spill: Dilute with water and mop up, or absorb with an inert dry material and place in the appropriate waste disposal container.

Large spills (>1 L) – Dial **9-911** from campus phones (and 805-893-3446 from a cell phone) and EH&S (893-3194) for assistance.

Chemical Spill on Body or Clothes – Remove clothing and rinse body thoroughly in emergency shower for at least 15 minutes. Seek medical attention. *Notify supervisor and EH&S immediately.*

Chemical Splash Into Eyes – Immediately rinse eyeball and inner surface of eyelid with water from the emergency eyewash station for 15 minutes by forcibly holding the eye open. Seek medical attention. *Notify supervisor and EH&S immediately.*

Medical Emergency Dial 9-911

Life Threatening Emergency, After Hours, Weekends and Holidays – Dial **9-911** (or 805-893-3446 from a cell phone) or go to the Emergency Room of Goleta Valley Cottage Hospital at 351 South Patterson Avenue, Goleta (Phone number: 805-967-3411) *Note: All Serious injuries must be reported to EH&S within 8 hours.*

Non-Life Threatening Emergency – Go to the Student Health Building, Building 588 (phone number: 893-5361, hours: M, T, R, F 8am-4.30pm, W 9am - 4.30pm, R 5pm to 7pm by appointment). After hours

go to the Emergency Room of Goleta Valley Cottage Hospital at 351 South Patterson Avenue, Goleta (Phone number: 805-967-3411) Note: All serious injuries *must* be reported to EH&S within 8 hours.

Needle stick/puncture exposure (as applicable to chemical handling procedure) – Wash the affected area with antiseptic soap and warm water for 15 minutes. For mucous membrane exposure, flush the affected area for 15 minutes using an eyewash station. Page the needle stick nurse \ and then enter your extension. After hours go to the nearest emergency room: the Emergency Room of Goleta Valley Cottage Hospital at 351 South Patterson Avenue, Goleta (Phone number: 805-967-3411). Note: All needle stick/puncture exposures *must* be reported to EH&S within 8 hours.

Decontamination/Waste Disposal Procedure

Wearing proper PPE, please decontaminate equipment and bench tops using soap and water. Please dispose of the used ethanol as hazardous waste in the appropriate waste container.

Waste disposal guidelines:

Label Waste

- Affix an hazardous waste tag on all waste as soon as the first drop of waste is added to the container

Store Waste

- Store hazardous waste in closed containers, in secondary containment and in a designated location

Dispose of Waste

- Dispose of regularly generated chemical waste within 90 days
- Call EH&S for questions (893-3194)
- Empty Containers
 - Rinse off the empty containers with water, dry and dispose capped in the glassware container or trashbin.

Safety Data Sheet (SDS) Location

Online SDS can be accessed at <http://www.sciencelab.com/msds.php?msdsId=9923955>

Protocol/Procedure

Ethanol is used as a solvent. It must be handled while wearing nitrile or latex gloves, safety goggles, and a lab coat. Ethanol can be handled inside or outside the fume hood, provided the area is well-ventilated. Due to its high flammability, ethanol has to be handled away from any ignition source. If spilled, clean with paper towels, and dispose of in proper waste container.

NOTE: Any deviation from this SOP requires approval from PI.

Documentation of Training (signature of all users is required)

- Prior to conducting any work with ethanol, designated personnel, i.e. approved users listed below, must provide training to his/her laboratory personnel specific to the hazards involved in working with this substance, work area decontamination, and emergency procedures.
- The Principal Investigator must provide his/her laboratory personnel with a copy of this SOP and a copy of the SDS provided by the manufacturer.

- The Principal Investigator must ensure that his/her laboratory personnel have attended appropriate laboratory safety training or refresher training as required by EH&S.

I have read and understand the content of this SOP:

Name	Signature	Trainer	Date
Prof. Susannah Scott			
Stephanie Goubert-Renaudin			
Gary Kwanyi Ng			
Alessandro Gallo			
Anthony Crisci			
Haibo Yu			
Taeho Hwang			
Bethany Wigington			
Daniel Coller			
Zachary Jones			
Youhong Wang			
Jinghong Zhou			
Jason Fendi			

