Standard Operating Procedure

Methanol

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 *(Name and Phone Number)*
Location(s) covered by this SOP:	ESB 3324 and 3328. *(Building/Room Number)*

Type of SOP: ☐ Process ☒Hazardous Chemical ☐ Hazardous Class

Purpose

Methanol is **highly flammable** and an **acute toxin.**

Very harmful in case of skin contact, eye contact, ingestion, or inhalation. Avoid all contact.

Also known as methyl alcohol, wood alcohol, wood naphtha or wood spirits.

Methanol is a common industrial and pharmaceutical laboratory solvent and has a variety of industrial applications.

Physical & Chemical Properties/Definition of Chemical Group

CAS#: 67-56-1

Class: **Highly flammable liquid, Toxic**

Molecular Formula: CH_3OH

Form (physical state): liquid

Color: colorless

Boiling point: 64.0 - 65.0 °C

Potential Hazards/Toxicity

Methanol is **highly flammable** and an **acute toxin.**

Methanol is very harmful in case of skin contact, eye contact, ingestion, or inhalation.

Methanol may be fatal or cause blindness if swallowed. Effects due to ingestion may include nausea, headache, vomiting, gastrointestinal disturbance, dizziness, weakness, confusion, drowsiness and unconsciousness. Can be fatal.

Long-term exposure to methanol vapor, at concentrations exceeding 3000 ppm, may produce cumulative effects characterized by gastrointestinal disturbances.

Has the following permissible exposure limit: 200 ppm TWA.

Has the following acute toxicity data:

Oral LD_{50} - rat - 5,628 mg/kg

Inhalation LC_{50} - rat - 4 h - 64000 ppm

Personal Protective Equipment (PPE)

Respirator Protection

Respirators should be used only under any of the following circumstances:

- As a last line of defense (i.e., after engineering and administrative controls have been exhausted).
- When Permissible Exposure Limit (PEL) has exceeded or when there is a possibility that PEL will be exceeded.
- Regulations require the use of a respirator.
- An employer requires the use of a respirator.
- There is potential for harmful exposure due to an atmospheric contaminant (in the absence of PEL)
- As PPE in the event of a chemical spill clean-up process

Lab personnel intending to use/wear a respirator mask must be trained and fit-tested by EH&S. This is a regulatory requirement.

Hand Protection
Gloves must be worn. Nitrile gloves are recommended. Use proper glove removal technique to avoid any skin contact.

NOTE: Consult with your preferred glove manufacturer to ensure that the gloves you plan on using are compatible with Methanol.

Refer to glove selection chart from the links below:
http://www.ansellpro.com/download/Ansell_8thEditionChemicalResistanceGuide.pdf
OR
http://www.allsafetyproducts.biz/page/74172
OR
http://www.showabestglove.com/site/default.aspx
OR
http://www.mapaglove.com/

Eye Protection
ANSI approved properly fitting safety glasses or chemical splash goggles.

Skin and Body Protection
Lab coats must be worn and be appropriately sized for the individual and buttoned to their full length. Laboratory coat sleeves must be of sufficient length to prevent skin exposure while wearing gloves. As outlined in UCLA Policy 905 personnel should also wear full length pants, or equivalent, and close-toed shoes.

Hygiene Measures
Wash thoroughly and immediately after handling. Remove any contaminated clothing and wash before reuse.

Engineering Controls

Handle using a chemical fume hood with good ventilation and electrically grounded lines and equipment.

First Aid Procedures

If inhaled
Move into the fresh air immediately and give oxygen. If not breathing give artificial respiration. Seek medical attention immediately.

In case of skin contact
Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash any contaminated clothing before reuse. Thoroughly clean shoes before reuse. Seek medical attention immediately.

In case of eye contact
Check for and remove any contact lenses. Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Seek immediate medical attention and continue eye rinse during transport to hospital.

If swallowed
Do NOT induce vomiting unless directed by medical personnel. Never give anything by mouth to an unconscious person. Seek medical attention immediately.

Special Handling and Storage Requirements

Precautions for safe handling: **Flammable**, avoid sources of heat or ignition. Avoid contact with skin and eyes and inhalation. Avoid inhalation of vapor or mist.

Conditions for safe storage: **Flammable**, avoid sources of heat or ignition. Store in a flame-proof cabinet. Keep in a dry place. Keep container tightly closed in a cool, dry, and well ventilated. Keep away from incompatible materials and conditions. Keep cool and protect from sunlight.

Spill and Accident Procedure

Chemical Spill Dial 9-911 and EH&S (805-893-3194)

Spill – Assess the extent of danger. Help contaminated or injured persons. Evacuate the spill area. Avoid breathing vapors. If possible, confine the spill to a small area using a spill kit or absorbent material. Keep others from entering contaminated area (e.g., use caution tape, barriers, etc.).

Small (<1 L) – If you have training, you may assist in the clean-up effort. Use appropriate personal protective equipment and clean-up material for chemical spilled. Double bag spill waste in clear plastic bags, label and take to the next chemical waste pick-up.

Large (>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

Use proper personal protective equipment and dispose chemical in the appropriate organic waste container.

Waste disposal guidelines:

Label Waste

- Affix an on-line hazardous waste tag on all waste containers using UCSB EH&S website 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
- Waste must be under the control of the person generating & disposing of it

Dispose of Waste

- Dispose of regularly generated chemical waste within 90 days
- Call EH&S for questions
- Empty Containers
    - Dispose as hazardous waste if it once held extremely hazardous waste (irrespective of the container size
    - Consult waste pick-up schedule

  Prepare for transport to pick-up location
        - Check on-line waste tag
        - Write date of pick-up on the waste tag
        - Use secondary containment

Safety Data Sheet (SDS) Location

SDS can be found online: http://ehs.ucsb.edu/units/labsfty/labrsc/chemistry/lschemmsdsacc.htm

Protocol/Procedure

In our group, methanol is used as a solvent. Methanol containers are stored in a ventilated storage cabinet and are kept sealed all the time when not in use.

Due to its toxicity, methanol is always handled while wearing nitrile gloves, as well as a lab coat and safety goggles. Gloves are changed as soon as they are contaminated.

Due to its toxicity by inhalation, when not handled in the glove box, methanol is used within a ventilated fume hood and away from any source of ignition as it is flammable.

Methanol containers have to be cap-sealed/closed when not in the fume hood, including when transferring the reaction vessel to the rotary evaporator.

Methanol has to be disposed in the appropriate organic container. The container has to be kept closed at all times.

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 Methanol, 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			