Standard Operating Procedure for Methanol

Methanol, CAS 67-56-1

# Section 1 – Lab-Specific Information

**Building/Room(s) covered by this SOP: BAG 005, 023**

**Unit or department: Chemistry Department**

**Principal Investigator Name: Sarah Keller**

**Principal Investigator Signature/Date:  24 Feb 2025**

**Type of SOP: Hazardous Chemical**

Methanol is h**ighly 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.

CAS#: 67-56-1

Class: Highly flammable liquid, Toxic

Molecular Formula: CH3OH

Form (physical state): liquid

Color: colorless

Boiling point: 64.0 - 65.0 °C

# Section 2 – Hazards

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 permissible exposure limit: 200 ppm TWA.

Has acute toxicity: Oral LD50 - rat - 5,628 mg/kg, Inhalation LC50 - rat - 4 h - 64000 ppm



# Section 3 – Engineering Controls and Personal Protective Equipment (PPE)

## Engineering controls

Handle using a chemical fume hood with good ventilation and electrically grounded lines and equipment. Any chemical fume hood used must be tested and passed by EH&S.

## Hygiene measures

Avoid contact with skin, eyes, and clothing. Wash hands after removing PPE, before breaks, and immediately after handling the chemical. If methanol comes into contact with any PPE, the PPE shall be immediately removed and discarded properly. Any potentially exposed body parts should be washed immediately. Wash thoroughly and immediately after handling. Remove any contaminated clothing and wash before reuse.

## Skin and body protection

Chemically compatible laboratory coats that fully extend to the wrist must be worn and be appropriately sized for the individual and buttoned to their full length. Appropriate lab coats are available in the Chem Stockroom. Personnel must also wear full-length pants, or equivalent, and close-toe shoes. The area of skin between the shoe and ankle must not be exposed.

**Hand Protection**

Gloves must be worn. Nitrile gloves are recommended. Use proper glove removal technique to avoid 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/>

Gloves must be inspected prior to use, including a check for pinholes.

Use proper glove removal technique (without touching glove’s outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands immediately after glove removal.

## Eye protection

ANSI Z87.1-compliant eye protection is required for all work with methanol. Ordinary prescription glasses will NOT provide adequate protection unless they also meet the Z87.1 standard and have compliant side shields. The minimum eye protection is safety glasses. Another option is chemical splash goggles.

## Respiratory protection

Respiratory protection is not required for the activities described in this SOP.

Respirators should be used as a last line of defense (i.e., after engineering and administrative controls have been exhausted), and when any Action Limit (AL) or Occupational Exposure Limit (OEL) has been exceeded or when there is a possibility that an AL/OEL will be exceeded. Respiratory protection may be needed if a dust, aerosol or vapor hazard is present *and* work is conducted outside of the fume hood. If any procedure may pose an external hazard, it should be eliminated or strictly isolated**.**

**If a potential exposure hazard cannot be eliminated, contact the EH&S** [Respiratory Protection Program](https://www.ehs.washington.edu/workplace/respiratory-protection) **administrator at uwresp@uw.edu, or call 206.543.7388** **to discuss respiratory protection or to enroll in the program so a respiratory protection analysis can be performed**. Program enrollment includes medical evaluation, training and fit testing for an appropriate respirator. Where air-purifying respirators are appropriate, use a full-face respirator with appropriate respirator cartridges as a backup to engineering controls. Use a full-face supplied air respirator if it is the sole means of protection.

# Section 4 – 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. Whenever possible, use within the fume hood.

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.

Users of chemicals are required to follow [labeling requirements](https://www.ehs.washington.edu/chemical/chemical-container-labels) when transferring chemicals to secondary containers and when labeling containers with chemical waste, UW-synthesized chemicals, [peroxide-forming chemicals](https://www.ehs.washington.edu/resource/ehs-guidelines-peroxide-forming-chemicals-168), and [Chemicals of Interest](https://www.cisa.gov/appendix-chemicals-interest). Requirements for labeling containers and templates for creating labels are available on the [EH&S website](http://www.ehs.washington.edu/chemical/chemical-container-labels).

Check [Section 2 of the Lab Safety Manual](https://www.ehs.washington.edu/resource/laboratory-safety-manual-510) and the [Chemical Compatibility Chart](https://www.ehs.washington.edu/system/files/resources/Incompatible_Chemicals_Focus_Sheet.pdf) on the EH&S website for incompatible chemical groups.

Special storage precautions may include keeping away from heat, light, air, flames, sources of ignition.

Check [Section 2 of the Lab Safety Manual](https://www.ehs.washington.edu/resource/laboratory-safety-manual-510) for information on chemical transport practices.

# Section 5 – Spill and accident procedures

Chemical spills must be cleaned up as soon as possible. All other persons should leave the area. Use the same PPE for spill cleanup as specified in Section 3.

**Spill –** Assess the extent of danger. Help contaminated or injured persons. Evacuate the spill area. Before leaving, lock doors and indicate spill if needed. 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) Spill –**Double bag spill waste in clear plastic bags, label and schedule chemical waste pick-up from EH&S.

**Large (>1 L) –** contact EH&S spill consultants at 206‐543‐0467 during normal business hours (Monday-Friday, 8 a.m. to 5 p.m.) or dial 911. If the spill is out of control, call 9-1-1. If a person is injured, exposed or suspected of being exposed, call 9-1-1 and be prepared to provide the dose, route of exposure, and time since exposure.

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

**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.

Spill cleanup materials must be disposed of by double-bagging all waste in plastic bags labeled with the contents. Submit a request to EH&S for waste pick-up.

**Report the incident to Environmental Health & Safety**.

* **Notify** **EH&S immediately** after providing first aid and/or getting help.
  + During business hours (M‐F/8‐5), call 206‐543‐7262.
  + Outside of business hours, call 206‐685‐UWPD (8973) to be routed to EH&S Staff On Call.
* Any spill, exposure or near miss incident requires the involved person or supervisor to complete and submit the [UW Online Accident Reporting System](https://oars.ehs.washington.edu/) (OARS) form on the EH&S website within 24 hours (certain [types of incidents require immediate notification](https://www.ehs.washington.edu/workplace/incident-reporting)).

# Section 6 – Waste accumulation and disposal procedures

**Accumulate waste at the point of generation** in a sturdy, glass jar with a securely-closable/screw‐top lid.

**All chemical waste containers must be labeled** with a [UW Hazardous Waste Label](https://www.ehs.washington.edu/chemical/hazardous-chemical-waste-disposal). Refer to [How to Label Chemical Waste Containers](https://www.ehs.washington.edu/system/files/resources/how-to-label-chemical-waste-containers.pdf).

More generally, refer to the SDS and [UW Laboratory Safety Manual](https://www.ehs.washington.edu/resource/laboratory-safety-manual-510), Section 3 for guidance on waste handling, labeling, accumulation, storage and pickup.

Per [UW Administrative Policy Statement 11.2](https://www.washington.edu/admin/rules/policies/APS/11.02.html), the University of Washington Environmental Health & Safety Department has full responsibility for collection of hazardous waste for the University, all its campuses, and off-site locations; **University laboratories cannot contract with an outside vendor to collect hazardous waste.**

**Be aware that many laboratory accidents happen from inadvertent disposal of** [**incompatible wastes**](https://www.ehs.washington.edu/system/files/resources/Incompatible_Chemicals_Focus_Sheet.pdf) **into the same waste container.** Therefore, identify different waste streams as appropriate.

Manage chemical and hazardous chemical waste separately from other waste streams such as biohazardous waste. Never autoclave chemical waste because it can produce hazardous chemical vapors, aerosols, and explosive reactions.

**All chemical waste containers must be labeled** with a [UW Hazardous Waste Label](https://www.ehs.washington.edu/chemical/hazardous-chemical-waste-disposal). Refer to [How to Label Chemical Waste Containers](https://www.ehs.washington.edu/system/files/resources/how-to-label-chemical-waste-containers.pdf).

To request a collection of chemical waste, submit a form on the [Chemical Waste Disposal](https://www.ehs.washington.edu/chemical/hazardous-chemical-waste-disposal) webpage on the EH&S website or directly in [MyChem](https://www.ehs.washington.edu/chemical/mychem) inventory. Contact EH&S at 206.616.5835 or [chmwaste@uw.edu](mailto:chmwaste@uw.edu) with questions.

Work area decontamination procedures as described in the section on spills should be followed, using PPE described above.

Visit the [Hazardous Material Disposal and Recycling](https://www.ehs.washington.edu/popular-services/hazardous-material-disposal-and-recycling) webpage on the EH&S website for information on disposing, recycling and surplusing materials.

# Section 7 – Protocol

Protocols for handling methanol in the Keller Lab are the same as outlined in Sections 3 and 4 above.

Refer to Section 2 of the [UW Laboratory Safety Manual](https://www.ehs.washington.edu/resource/laboratory-safety-manual-510) on the EH&S website for additional guidance on chemical management and preparation for use for [particularly hazardous substances](https://www.ehs.washington.edu/resource/particularly-hazardous-substances-655) (PHSs).

**NOTE:** Any deviation from this SOP requires approval from Principal Investigator.

# Section 8 – Special Precautions for animal use (Not relevant)

This section is not applicable (“N/A”) because our lab does not use animals.

[**PARTICULARLY HAZARDOUS SUBSTANCE**](https://www.ehs.washington.edu/resource/particularly-hazardous-substances-655) **INVOLVED?**

**YES: Sections #9 to #11 are Mandatory.**

# Section 9 – Approvals required

All staff working with acrylamide must consult this SOP prior to starting work. They must also review the acrylamide SDS, which is available through the Keller Laboratory website and EH&S.

# Section 10 – Decontamination

• If the eyes or body of any person may have been exposed, a safety shower/eye wash must be available for immediate use. Personnel who are working with acrylamide must be aware of location of nearest Safety Shower/Eye Wash and verify that a current certification of performance tag is present.

• Personnel shall rinse exposed areas of skin and/or eyes with copious amounts of water for at least 15 minutes.

• All equipment, materials and work surfaces that have/ potentially have become contaminated shall be cleaned in accordance with those identified for small spill in Section 5.

# Section 11 – Designated area

Methanol may be used in the wet laboratories (BAG 005 and 023), and should be used in the fume hood whenever possible.

# Section 12 – Documentation relevant to ALL Particularly Hazardous Substances

* Lab members are expected to review the laboratory’s inventory of chemicals to identify any “Particularly Hazardous” substances. The inventory appears in MyChem with the letters “P” or “B” in the column labeled “Reg”.
* Before working with any of the “Particularly Hazardous” substances, lab members must review the laboratory’s SOP for that substance to learn how to protect themselves from the hazards and how to enact emergency procedures.
* Ready access to SOPs and to a Safety Data Sheets for all Particularly Hazardous materials used in the Keller Lab are available through the Keller Lab website.
* If lab any lab member determines that the SOP should be revised or if the substance is being used in a way that is not covered in the SOP, the lab member should bring it to the attention of the P .and propose changes to this SOP.
* Lab members must attest (in a separate document that applies to all Particularly Hazardous substances) that they will adhere to the policies in this SOP.