

Standard Operating Procedures

Laboratory Specific

Chemical: **Formaldehyde**

Please fill out the form completely. Print a copy and insert into your Chemical Hygiene Plan.

Department:

Date when SOP was written:

Date when SOP was approved by the lab supervisor:

Principal Investigator:

Internal Laboratory Safety Coordinator/Lab Manager:

Laboratory Phone:

Office Phone:

Emergency Contact:

Location(s) covered by this SOP:

Type of SOP: Process Hazardous Chemical Hazard Class

Purpose:

Formaldehyde and Formalin, commonly used as fixatives and as nucleic acid denaturants, is a regulated carcinogen. The OSHA Permissible Exposure Limit is 0.75 ppm in an eight hour time weighted average. Approximately 1.5 grams of vaporized Formaldehyde will achieve this concentration in a typical laboratory (not accounting for air flow). The odor threshold of formaldehyde is reported to be as low as 0.1 ppm.

Physical & Chemical Properties/Definition of Chemical Group

CAS#: 50-00-0

Class: **OSHA regulated carcinogen**
Carcinogen (IARC Group 2B)

Molecular Formula: CH₂O

Form (Physical State): Liquid, as 37% or 16%

Potential Hazards/Toxicity

LD50:

Oral: 100 mg/kg [Rat]

Dermal: 270 uL/kg [Rabbit]

Permissible Exposure Limits (PEL): 0.75 ppm

Acute Effects:

Hazardous in case of eye contact (irritant), of ingestion. Slightly hazardous in case of skin contact (irritant, sensitizer, permeator). Non-corrosive for skin. Non-corrosive to the eyes. Non-corrosive for lungs. Severe over-exposure can result in death.

Chronic Effects:

Slightly hazardous in case of skin contact (sensitizer)

Mutagenic Effects:

Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. Classified possible teratogen for humans.

Developmental Toxicity:

Classified reproductive system toxin. The substance may be toxic to kidneys, liver, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Personal Protective Equipment (PPE)

The level of skin and eye protection should be selected based on the potential for splashing and other forms of exposure.

Minimum potential for splash & exposure:

- Single pair of chemical resistant gloves (nitrile or natural rubber)
- Protective clothing (e.g. non-porous lab coat, impervious sleeves; closed-toed impervious shoes)

When using or transferring large quantities (>1 L):

- Single pair of chemical resistant gloves (nitrile or natural rubber)
 - Immediately replace with new gloves when splash occurs.
- Chemical resistant lab coat
 - Avoid using the traditional cotton-polyester white lab coat, which readily collects/absorbs compounds.
- Protective clothing (e.g. non-porous sleeves, closed-toed impervious footwear)

Engineering Controls

- All operations involving formaldehyde and dilutions should be carried out in a certified chemical fume hood or a ducted Biosafety cabinet to keep airborne level below recommended exposure limits.
- Chemical fume hoods used as containment areas for particularly hazardous chemicals must have a face velocity of 80 cfm, averaged over the face of the hood and must be certified annually.
- Laboratory rooms must be at negative pressure with respect to the corridors and external environment. The laboratory/room door must be kept closed at all times.

Vacuum lines are to be protected by HEPA (high efficiency particulate air) filters or higher efficiency scrubbers.

First Aid Procedures

Skin & Eye Exposure:

Minor skin contact requires washing with water. Soaking or flushing contaminated areas of the skin with water for periods up to 15 minutes is required if a large area comes into contact with the chemical, or if prolonged contact occurs. Contaminated clothing may hold the chemicals in contact with the skin without being immediately noticed so remove clothing immediately and wash thoroughly before use.

In the event of eye contact, the eye should be immediately be flushed with water. If the chemical is very irritating, it is likely that the affected individual will require assistance to hold the eye open during the flushing.

Ingestion:

- DO NOT induce vomiting, give milk, activated charcoal or water if conscious, and get medical attention immediately.

Inhalation:

- Remove rapidly to clean air. Administer rescue breathing if necessary and call emergency services. Seek medical attention if needed.

Special Handling and Storage Requirements

Designated Areas

- Designated area(s) for use and storage of formaldehyde must be established.
- All chemicals containing formaldehyde must be secondarily contained with proper signage.
- Signage is required for the container, designated work area and storage location. Sign wording must state the following:

"DANGER, CANCER HAZARD"

Spill and Accident Procedure:

Toxic vapors, including irritating gaseous formaldehyde, may be given off in a fire. In the event of fire, evacuate and bar further entry.

Chemical Spill Dial 911 and 951-0194

Spill - Help contaminated or injured persons. Evacuate the spill area. Avoid breathing vapors. Eliminate sources of ignition if the chemical is flammable. 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 911 (or 310-825-1491 from cell phone) and SRS at 951-0194 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 SRS at 951-0194 immediately.

Chemical Splash Into Eyes -Immediately rinse eyeball and inner surface of eyelid with water for 15 minutes by forcibly holding the eye open. Seek medical attention. Notify supervisor and SRS at 951-0194 immediately.

Medical Emergency Dial 911 from any campus phone

Life Threatening Emergency, After Hours, Weekends and Holidays- Dial911 (or SRS at 951-0194) or contact the. Note: All serious injuries must be reported to SRS at 951-0194

Non-Life Threatening Emergency- Go to the Employee Occupational Health Services, or the UNMH Emergency Room.

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. Contact EOHS for information and medical assessment or assistance.

Decontamination/Waste Disposal Procedure

No waste streams containing (insert chemical) shall be disposed of in sinks. Decontaminate work space with 70-75% ethanol. Wash hands and arms with soap and water after finished. Contaminated pipet tips, eppendorf tubes, and gloves should be discarded as hazardous waste according to UNM-SRS waste disposal procedures.

Formaldehyde (formalin, paraformaldehyde) contaminated waste containers must be labeled:
"DANGER, CANCER HAZARD"

Material Safety Data Sheet (MSDS) Location

(State the location of MSDS) Hardcopy and electronic copy MSDS from the same manufacturer should be available for formaldehyde (one must be available).

Protocol/Procedure

(Add specific description of procedure)

Prepare fixative solutions in ventilated chemical fume hood.

Documentation of Training (signature of all users is required)

- Prior to conducting any work with formaldehyde, designated personnel 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 formaldehyde MSDS provided by the manufacturer.
- The Principal Investigator must ensure that his/her laboratory personnel have attended appropriate laboratory safety training or refresher training within the last two years.

I have read and understand the content of this SOP:

Name	Signature	Date
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