



## STANDARD OPERATING PROCEDURE 602 FORMALDEHYDE

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### 1. PURPOSE

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This Standard Operating Procedure (SOP) intends to describe the safe use of formaldehyde.

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### 2. RESPONSIBILITY

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Principal investigator (PI) and their research staff.

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### 3. GENERAL CONSIDERATIONS

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- 3.1. Chemical - formaldehyde is a flammable liquid, irritant, sensitizer, and potential human carcinogen.
  - 3.2. Formaldehyde is commonly used as a fixative, a nucleic acid denaturant, and for tissue preservation.
  - 3.3. Paraformaldehyde solutions can emit formaldehyde gas.
  - 3.4. Acute exposure to formaldehyde may result in pulmonary edema (fluid in the lungs), central nervous system (CNS) depression, or pneumonitis (inflammation of the lung tissue)
  - 3.5. Chronic exposure may cause skin, mucous membranes, or respiratory tract irritation.
  - 3.6. It is also a potential carcinogen.
  - 3.7. Primary exposure routes are inhalation and skin absorption.
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### 4. PERSONAL PROTECTIVE EQUIPMENT (PPE)

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- 4.1. Chemical splash goggles.
- 4.2. Double pair of chemical-resistant gloves. Change gloves frequently and immediately replace them with new gloves when gloves become contaminated.
- 4.3. Lab coat.
- 4.4. Closed shoes (covering toes, non-absorbing material).

**Note: Latex gloves are not recommended**

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### 5. ENVIRONMENTAL CONSIDERATION

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- 5.1. All operations involving formaldehyde and dilutions should be carried out in a certified chemical fume hood or a ducted Biosafety cabinet to keep the airborne level below recommended exposure limits

- 5.2. Routine use outside a fume hood is acceptable only when formaldehyde levels are monitored and below 0.5 ppm.
- 5.3. Vacuum lines are protected by HEPA (high-efficiency particulate air) filters.
- 5.4. If disposed of as hazardous waste, label it with a hazardous waste label, accumulate it according to requirements, and send in a chemical collection or routine pickup request.
- 5.5. Disposal of sample tissues or material soaked in formaldehyde:
  - 5.5.1 For animal samples stored in formaldehyde: separate and filter the sample from the solution in a fume hood.
  - 5.5.2 Dispose of the solution as chemical waste and the sample in the regular trash (after the solution has evaporated).

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## **6. HANDLING PROCEDURES AND STORAGE REQUIREMENTS**

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- 6.1. Work with concentrated (>4% formaldehyde/paraformaldehyde) solutions only in a chemical fume hood.
- 6.2. Handle paraformaldehyde powder (preferably granules or flakes) only in a chemical fume hood.
- 6.3. Dilute solutions (<4% formaldehyde) may be used on the benchtop in small quantities if the process has been monitored and formaldehyde levels are determined to be at acceptable safe levels.
- 6.4. Store in a cool, dry well, ventilated, flammable liquid storage area or cabinet. Do not store with strong oxidizing or reducing agents, strong acids or bases, alkalies, alkali metals, amines, ammonia, or phenol.
- 6.5 Transport formaldehyde solutions in secondary containment, preferably a polyethylene or other non-reactive acid/solvent bottle carrier

Note: The PI must approve any work conducted outside of a fume hood, and the PI must contact the safety unit and request air monitoring for formaldehyde. Air monitoring must be completed before using outside a fume hood.

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## **7. ACCIDENT RESPONSE PROCEDURES**

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- 7.1. If the skin is exposed, wash immediately with soap and water. Flush mucous membranes with large amounts of water. Use a wet shower in case of extensive contamination.
  - 7.1.1. Report the incident to the supervisor.
  - 7.1.2. The supervisor reports the accident/injury to the Biosafety Unit.
  - 7.1.3. Remove all sources of ignition from the spill area.
  - 7.1.4. Spills in fume hood - use absorbent pads or vermiculite to clean up small fume hood spills.
  - 7.1.5. Clean the spill area with additional pads or paper towels, followed by clean water.
  - 7.1.6. Spills in the room – Notify others of the spill and keep the spill confined.
- 7.2. Spills must be cleaned immediately by adequately protected and trained staff.
- 7.3. Respiratory protection is required to clean up formaldehyde spills outside an operating fume hood, as well as a disposable lab coat, goggles, and two pairs of nitrile gloves.
- 7.4. Use the same procedure as “spill in the fume hood.”

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## 8. REQUIRED AUTHORIZATION

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- 8.1. The chemical safety officer must approve the suitability of the location and equipment to use urethane and have a startup meeting with the PI and research team before procurement.
- 8.2. The Principal Investigator (PI) must provide lab-specific training to all laboratory workers specific to the hazards (physical and health) involved in working with the substance, work area decontamination, and emergency procedures.
- 8.3. The PI must provide a copy of the MSDS and this SOP to lab personnel working with any materials covered.
- 8.4. The PI must ensure that all lab personnel has attended the required training and refresher training.

**SOP 602 FORMALDEHYDE**

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*Approved by the BGU Animal Policy and Welfare Oversight Committee*