

Formaldehyde (Formalin) & Paraformaldehyde

Laboratories should create their own specific SOP's for the use of Formaldehyde and Paraformaldehyde



CAS #: 50-00-0; Concentrations range from 10%-37% Wt.%

CAS# 30525-89-4; Can be found in solution or as solid

Formaldehyde is a colorless gas with a strong, pungent, irritating odor. **Formaldehyde** is typically sold as in a water solution containing approximately 37%. This is often referred to as "**formalin**." In some research labs this solution is diluted to 10% and is called 10% formalin or just "formalin." Formaldehyde is also available in the polymerized solid form as **para-formaldehyde**.



Hazards	<p>Potential Hazards</p> <ul style="list-style-type: none"> • <i>The precise hazards associated with exposure to formaldehyde depend both on the form (solid, liquid, or gas) of the material and the concentration of formaldehyde present.</i> • For further safety information, refer to Laboratory Chemical Safety Summary for Formaldehyde (Pub Chem), New Jersey Right to Know Fact Sheets for Formaldehyde and Paraformaldehyde and manufacturer Safety Data Sheet • Formalin and paraformaldehyde solutions can emit formaldehyde gas, a known human carcinogen, and can irritate the eyes and skin. • Solutions with over 25% formaldehyde are flammable. • Working with paraformaldehyde powder (and, to a lesser extent, flakes or granules), can expose employees to paraformaldehyde dust, which is a strong irritant/sensitizer. • Contact with these solutions or paraformaldehyde solids may also cause drying of the skin and/or allergic dermatitis. • 	
Hazard Controls	<p>Selection & Purchase</p> <ul style="list-style-type: none"> • Purchase the smallest container at the lowest concentration practical. • Please notify Dartmouth EHS by e-mailing us a ehs@dartmouth.edu or calling 603-646-1762 if your lab used these substances. 	
	<p>Storage & Transport</p> <ul style="list-style-type: none"> • Transport formaldehyde solutions in secondary containment, preferably a polyethylene or other non-reactive acid/solvent bottle carrier. • Keep container in cool, well-ventilated area. • Keep container tightly closed and sealed until ready for use. • Store in secondary containment with flammables, away from oxidizers, reducing agents, metals, and acids. • Keep containers of paraformaldehyde solid away from water. • Avoid storing on the floor. • Avoid ignition sources. 	
	<p>Engineering Controls & Safety Equipment</p> <ul style="list-style-type: none"> • Work with concentrated (>4% formaldehyde/paraformaldehyde) solutions only in a chemical fume hood. • Handle paraformaldehyde powder (and, preferably, granules or flakes) only in a chemical fume hood. • Dilute solutions (<4% formaldehyde) may be used on the benchtop in small quantities. <p>If there is any possibility that an employee's eyes may be splashed with solutions containing 0.1 percent or greater formaldehyde, an eyewash/drench hose must be available within the immediate work area for emergency use.</p>	

	<p>Engineering Controls & Safety Equipment (Cont.)</p>	<ul style="list-style-type: none"> If employees' skin may become splashed with solutions containing 1 percent or greater formaldehyde, for example, because of equipment failure or improper work practices, the OSHA formaldehyde standard requires a conveniently-located safety shower. Contact Dartmouth Environmental Health and Safety by e-mailing us a ehs@dartmouth.edu calling 603-646-1762 to determine if a safety shower will be needed. 	
	<p>Work Practice Controls</p>	<ul style="list-style-type: none"> Designate an area for working with concentrated formalin, concentrated paraformaldehyde solutions, and paraformaldehyde solid, and label it as such. Keep containers closed as much as possible. Use in the smallest practical quantities for the experiment being performed. If you are weighing paraformaldehyde powder and the balance cannot be located in a fume hood or BSC, tare a container then add powder in the hood and cover before returning to the balance to weigh the powder. Labs handling moderate to large quantities of formaldehyde-containing solutions on a regular basis should contact Dartmouth EHS by e-mailing us a ehs@dartmouth.edu or calling 603-646-1762 for assessment of exposure. Areas that handle only small (100 ml or less) pre-filled specimen containers, or that work with formaldehyde-containing solutions exclusively in a functioning chemical fume hood, would have low potential for overexposure, but should contact Dartmouth EHS if there are concerns. Once work with formalin/paraformaldehyde is complete, wipe down area with a soap and water solution. 	
	<p>Personal Protective Equipment (PPE)</p>	<ul style="list-style-type: none"> Dartmouth College has a Policy on PPE for Chemistry Wear closed-toed shoes and clothing covering the legs. Wear standard nitrile laboratory gloves Dartmouth College Stockrooms provide Purple Nitrile Gloves which have a thickness of 0.09-0.15 mm from Cuff to Middle Finger. Safety glasses (recommended: chemical splash goggles) Lab coat Recommended: face shield If splash may occur; it is recommended to wear impervious apron. 	
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Other</p>	<p>Emergencies & Spills</p>	<ul style="list-style-type: none"> For fire or potential for a fire – Pull nearest fire alarm pull station, evacuate the building and go to a safe location to dial 911. (In Borwell, Rubin and Williamson, dial 5555) Serious injury or exposure to a hazardous material -- dial 911 <ul style="list-style-type: none"> Find the nearest eyewash station or safety shower Flush the contaminated area with large volumes of water While flushing, remove any clothing which may have been contaminated (including shoes) If the injury is to the eyes, hold the eyes open to ensure irrigation under the eyelids (15 minutes minimum) Continue flushing until EMS arrives Spill is beyond your ability to control contact EHS 603-646-1762 or after hours contact Safety and Security at 603-646-3333. Employees in the area should be prepared to clean up minor spills, including most spills confined to the chemical fume hood. Wearing double nitrile gloves, splash goggles, face shield and lab coat (and impermeable apron, if available), use absorbent pads to absorb spilled material. (For small spills of solid paraformaldehyde, dampen the absorbent pad with methanol before placing over the spilled material and allow to sit for a few minutes before wiping up.) After spill has been completely absorbed, wash down area with soap and water at least two times. Contaminated PPE and clean-up materials must be placed in a clear plastic bag or compatible container for pick-up by EHS. 	

Waste	<ul style="list-style-type: none"> Label any waste containers with the appropriate waste labels. Store in secondary containers. For waste pick up and disposal contact Dartmouth EHS by e-mailing ehs@dartmouth.edu
Training	Dartmouth College requires certain training for employees. For this chemical Laboratory Safety/ Hazardous Waste Management is required. This training is mandatory for all personnel working in a teaching or research wet laboratory. It is an introductory program on laboratory safety and waste management in a biomedical, engineering, chemistry, earth science or physics lab at Dartmouth College. The course takes approximately 45 minutes to complete. Completion is required every three years.
Medical Surveillance	
Monitoring Requirements	Formaldehyde has a monitoring OSHA standard for exposure. The OSHA Permissible Exposure Limit for formaldehyde is 0.75 ppm for 8 hours or 2 ppm for 15 minutes. The substance-specific OSHA standard for formaldehyde has an action limit of 0.5 ppm.
Questions	Contact Dartmouth Environmental Health and Safety by e-mailing us a ehs@dartmouth.edu calling 603-646-1762 or visting our website .

“I have read and understand this Guidelines. I agree to fully adhere to its requirements.”

Last	First	Dartmouth ID	Signature

Acknowledgement: Special thanks for Duke’s Occupational & Environmental Safety Office for their permission to use this great design for our chemical guidelines. All Dartmouth High Hazard Guidelines are based on [Duke OESO Chemical SOP’s and Guidelines](#)