

FORMALDEHYDE FACT SHEET

General Information

Formaldehyde (CH₂O) is a colorless gas that has a pungent and suffocating odor. Paraformaldehyde is a solid polymer of formaldehyde. Formaldehyde is most commonly used as formalin, a liquid solution. Formaldehyde and paraformaldehyde solutions are used for preserving tissues through perfusions.

➔ **Refer to the SDS for more specific chemical information before handling hazardous chemicals; SDS can be accessed from the EHSO website: www.ehso.emory.edu.**

Health Hazards

Formaldehyde is classified as a human carcinogen, toxic, irritant, and sensitizer. Chronic exposures to formaldehyde are associated with lung and nasal cancers. Formaldehyde exposures occur primarily through respiratory and oral routes. Skin and eye exposures are also of concern. The following is a list of the routes and symptoms of formaldehyde exposure:

ROUTE	SYMPTOMS
INHALATION	Very low concentrations (0.1 – 5 ppm) of formaldehyde vapor can cause irritation of the respiratory tract. Exposure to 10 ppm can cause chest tightness, coughing, and difficulty breathing. Exposures to concentrations above 25 ppm can cause severe lung injury, pulmonary edema, and possible death.
INGESTION	Severe irritation of the mouth, throat, and stomach can occur. Ingestion of formaldehyde can also lead to nausea, vomiting, convulsions, coma, and death.
SKIN	Contact with formaldehyde can cause eczema and severe burns. Because formaldehyde is a sensitizer, repeated exposures can lead to allergic dermatitis and hives.
EYE	Severe eye irritation occurs at concentrations from 3-5 ppm. Direct contact with eyes can cause severe burns, blurry vision, and vision loss.

Physical Hazards

Formaldehyde and its solutions are flammable and may be ignited by heat, sparks, or flames. Vapors may form explosive mixtures with air. Formaldehyde solutions are corrosive with a pH range of 2.8-4.

Exposure Limits

The Occupation Safety and Health Administration's (OSHA) permissible exposure limit is 0.75 ppm (8-hour time weighted average) with an action level set a 0.5 ppm (8-hour time weighted average). The 15-minute short-term exposure limit is 2.0 ppm.

Exposure Monitoring

Anyone working with formaldehyde should contact the Industrial Hygiene Officer for an industrial hygiene review of exposure. Should monitoring levels exceed OSHA standards, EHSO will implement a formaldehyde training program and reevaluate the

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available engineering controls and use of personal protective equipment (PPE). Contact Carol Wilkins-Hall at 404-727-5684.

Exposure Control

- **Engineering Controls:**
 - All manipulations of formaldehyde, such as weighing and solution preparation, must be conducted in a chemical fume hood.
 - Perfusion must be conducted with appropriate engineering controls such as point source ventilation, chemical fume hoods, or down draft tables.
- **Personal Protective Equipment (PPE):**
 - Appropriate PPE such as safety glasses or goggles, lab coat or gown and nitrile gloves should be worn while working with formaldehyde.
 - If there is a possibility for a splash to the eyes, chemical splash goggles and a face shield are required.
 - Respiratory protection will be required if engineering controls are insufficient based on industrial hygiene monitoring to keep the employee below the OSHA Action Level of 0.5 ppm (8-hr TWA).
- **Storage:** Formaldehyde should not be stored near oxidizers, amines, caustics, nitrogen compounds, alkali and alkaline earth metals, dithiocarbamates, and unsaturated aliphatics and sulfides.

Disposal Procedures

➔ Refer to the EHSO Website for information on chemical waste disposal: <http://www.ehso.emory.edu/waste/index.cfm> .

- **Formaldehyde, formalin, and paraformaldehyde must be disposed of through EHSO's Environmental Compliance group.**
- Scheduling of disposal may be performed by emailing Environmental Compliance at chemwaste@emory.edu.
- Ensure that biological materials (i.e. tissues and body parts) are disposed of separately in the biohazardous waste stream.
- Animal carcasses should be disposed of through the appropriate animal facility.

Spill Response

In the event of a spill, isolate the contaminated area immediately and notify your supervisor.

➔ **Contact EHSO for spill clean-up.**

Exposure Response

- Immediate response
 - Skin exposures: wash the area immediately with soap and cold water for 15 minutes.
 - Eye exposures: wash the area immediately with the eyewash for 15 minutes.
NOTE: Eye exposures require immediate medical evaluation.
 - Oral exposures: flush the mouth with water for 15 minutes.
 - Inhalation exposures: seek fresh air immediately.

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- **For all exposures:** Seek immediate medical attention at your designated location.
 - For Emory's main campus, medical attention should be obtained from Employee Health Services or the Emergency Department at Emory University Hospital.
 - For Emory University Hospital Midtown, medical attention should be obtained from WW Orr Building, 6th Floor.
 - For Wesley Woods Center, medical attention should be obtained from the Administration Building, 1st Floor.
 - Notify your supervisor and EHSO of the incident.
- Complete an [Incident Report](#) for all exposures or injuries.

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