

DESERT RESEARCH INSTITUTE

Guidelines for Laboratory-Scale Use of Formaldehyde

(Formalin, Morbucid Acid, Methylene Oxide, Methyl Aldehyde)

INTRODUCTION

Formaldehyde in the gaseous form is a suspect human carcinogen. As such the use of this chemical requires the completion of a PHS Use Approval Form and the purchase must be approved by the Principal Investigator before ordering. The amount purchased should be limited to only the quantity needed to complete the project to avoid disposing the excess as hazardous waste. The user is responsible for ensuring a current Material Safety Data Sheet (MSDS) is obtained unless a one is already available within the laboratory.

Formaldehyde use must be conducted in designated areas (preferably a hood) within the laboratory unless the laboratory itself has been deemed a designated use area. Use areas are required to be posted with appropriate warnings (see Section V.B of the DRI Chemical Hygiene Plan). Additional lab specific details on how and where these materials are used in the lab and lab specific safety measures shall be outlined on the PHS Use Approval Form and may be appended to this document or included in other lab specific safety documents that are used for employee lab specific safety education.

POTENTIAL HAZARDS

In addition to being a suspect carcinogen, formaldehyde is a combustible liquid, corrosive, and strong sensitizer. It is harmful if inhaled or absorbed through the skin. It causes irritation to the skin, eyes and respiratory tract. Formaldehyde solutions may be fatal or cause blindness if swallowed and cannot be made nonpoisonous due to the presence of methanol in these solutions.

Acute Exposure: Harmful if inhaled or absorbed through skin. May be fatal or cause blindness if swallowed. Causes irritation to skin, eyes, and respiratory tract. Can cause nausea, vomiting, convulsions, and coma.

Chronic Exposure: May cause cancer. Cancer risk depends on level and duration of exposure. Prolonged or repeated exposure to formaldehyde can cause dermatitis and sensitization of the skin and respiratory tract. Detection of formaldehyde by odor and eye irritation lessens with time as one adapts to formaldehyde. This can lead to overexposure if a worker relies on formaldehyde's warning properties to alert him or her of the possible exposure.

Formaldehyde is regulated by OSHA in Title 29 Code of Federal Regulation 1910.1048. Lab-scale use of this material is exempted from the formaldehyde standard provided exposures to laboratorians is less than the action level of 0.5 ppm (which is one half the permissible exposure limit) as averaged over an eight hour working day. A pungent odor is detectable at 1 ppm (OSHA PEL). **If airborne exposure is suspected** at or above the action level, **stop work** and contact EH&S for assistance in conducting a work hazard assessment and hazard mitigation and monitoring protocol.

PERSONAL PROTECTIVE EQUIPMENT

Skin and eye protection must be used when working with formaldehyde. At a minimum, ANSI Z87 safety glasses or chemical safety goggles are required and a face shield should also be used if a splashing hazard exists. To prevent skin contact, wear butyl or Nitrile gloves with a lab coat and/or chemical apron.

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ENGINEERING CONTROLS

Work with formaldehyde in a chemical hood or with local exhaust ventilation. Use only in an area equipped with an emergency shower and eyewash.

SPECIAL HANDLING PROCEDURES & STORAGE REQUIREMENTS

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Containers of this product are hazardous when empty until neutralized with a mild sodium bicarbonate solution. The rinsate must be collected and managed as hazardous waste. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames.

Storage: Keep in a tightly closed container. Store in a cool, dry, ventilated area with other compatible substances (separate from oxidizers and bases). Avoid static sparks and keep away from ignition sources. Protect from freezing.

SPILL AND ACCIDENT PROCEDURES

Skin Contact: Immediately flush skin with copious amounts of water for at least 15 minutes while removing any contaminated clothing. Get medical attention immediately.

Eye Contact: Immediately flush eyes with copious amounts of water for at least 15 minutes (lifting upper and lower eyelids occasionally). Get medical attention immediately.

Inhalation: Remove to fresh air. Administer oxygen if breathing is difficult. Administer artificial respirator or CPR if breathing has ceased. Get medical attention immediately.

Ingestion: If victim is conscious, give 2-4 cups of milk or water. Never give anything by mouth to an unconscious person. If vomiting occurs, keep head below hips. Get medical attention immediately. Poison Control number: 1-800-222-1222.

Incidental Spill (<1 liter): Do not attempt cleanup if you feel unsure of your ability to do so, or if you perceive the risk to be greater than normal laboratory operations. Ventilate the area and use proper personal protective equipment. Absorb the material with an inert material such as vermiculite, sand, or solvent absorbent and place in a suitable container, label with the words "hazardous waste". Do not flush to sanitary sewer and avoid runoff into storm sewer and ditches which lead to waterways.

Large Spill: Alert others in immediate area, remove ignition sources, provide adequate ventilation, evacuate the laboratory, close the doors and call the EH&S emergency number 775-742-6330.

DECONTAMINATION

After cleaning up spilled materials, thoroughly wash the area with a mild sodium bicarbonate solutions, then rinse. Treat all clean up materials as non-RCRA wastes. Specific instructions may be developed for the lab and should be included here _____

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WASTE DISPOSAL PROCEDURES

Formaldehyde waste and any spill clean up materials should be placed in properly labeled, suitable containers with a securely sealed lid. Submit a [Request for Waste Disposal Form](#) to EH&S to arrange for pick up and disposal.

MSDS LOCATION (list lab specific location here) _____

TRAINING

Lab specific standard operating procedures must be developed and all laboratorians who work with or are potentially exposed to formaldehyde in the lab must receive documented training and education about the hazards and how to minimize them.