

School Material Safety Data Sheet

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FORMALIN

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SECTION 1. INTRODUCTORY INFORMATION

MATERIAL NAME AND FORMULA: FORMALIN; HCHO (in Solution)

SYNONYMS: Formaldehyde, Aqueous; Methanal, Aqueous; Methylene Oxide Solution; Methyl Aldehyde Solution

CAS NUMBER: 0050-00-0

INGREDIENTS: *Formaldehyde (HCHO), 37-55%; *Methanal (CH₃OH), 0.0-15%; Formic Acid (Trace); water (remainder).

*Methanal level is controlled by purchase specification.

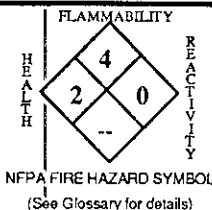
DOT CLASSIFICATION: Combustible Liquid. ORM-A (less than 110 gal)

EPA CLASSIFICATION: Hazardous Substance, Hazardous Waste

MANUFACTURERS: Always request Material Safety Data Sheets from your chemical supplier. These should indicate the manufacturer of the substance and include an emergency phone number to call. The Manufacturers section of this book contains a listing of some of the larger manufacturers and available emergency numbers.

DESCRIPTION: Formaldehyde is a colorless, pungent gas. Formalin is a clear, water white water solution of the gas (37-50%), which may contain up to 15% methanal as a stabilizer to prevent polymerization. The odor is detectable at about 1 ppm of HCHO.

PRELIMINARY INFORMATION: Formalin has been used in various chemical applications (in chemistry) and as a preserving (embalming) fluid in biology. It is currently classified as a human carcinogen (see sect. 4) as well as being toxic and an irritant. This material is not recommended for use or storage in schools if alternatives can be found. Amounts on hand should be kept to a minimum in any case (see also sect. 2).



SECTION 2. USE AND STORAGE INFORMATION

- PRELIMINARY PLANNING CONSIDERATIONS -

- Safety glasses or goggles and protective clothing (rubberized apron, etc.) should be worn for all experiments.
- Be sure eyewash station and safety shower are in good working order and readily available.
- Always provide for safe disposal of all chemical waste generated in the lab. Check applicable regulations prior to use.
- Whenever possible, substitute less hazardous materials.
- Neoprene, PVC, or butyl rubber gloves are recommended when working with this material.
- Oxygen from the air can oxidize formaldehyde to formic acid (corrosive), especially when heated.
- Prepare procedures in advance that are to be followed to respond to spills or breakage of specimen jars containing formaldehyde.

- USAGE PRECAUTIONS AND PROCEDURES -

- For safety, contact lenses should not be worn in the laboratory; soft lenses may absorb and all lenses may concentrate irritants.
- READ THE LABEL and follow all precautions.
- Maintain good housekeeping practices to avoid unintentional mixing with incompatible materials.
- After working with this material, always wash hands and face before eating, drinking, or smoking.
- Do not breathe vapors - use and dispense only in a fume hood, especially for histology applications.
- No smoking in storage or use area.
- Keep away from strong oxidizing agents and sources of heat or ignition.

-- ADDITIONAL INFORMATION --

- Formalin solutions can undergo a nonhazardous self-polymerization to form a precipitate of paraformaldehyde.
- Will polymerize with active organic materials such as phenol.
- Reaction of HCl vapors (commonly present in storage areas, etc.) and formaldehyde vapors can produce a very potent CARCINOGEN bis chloromethyl ether (chloromethoxy chloromethane).
- Solutions are available from suppliers to displace formaldehyde already in use for embalmed specimens.
- If formaldehyde-preserved specimens are used, wash in gently running water overnight to reduce exposure level. NONFORMALDEHYDE-PRESERVED SPECIMENS CAN AND SHOULD BE PURCHASED!

-- PREFERRED STORAGE LOCATION AND METHODS -

- Storage area should be especially cool and well ventilated due to low flashpoints. Containers should be tightly closed.
- Do not store chemicals alphabetically by name; store by chemical family instead to keep compatibles together.
- All chemical containers should be protected from physical damage and kept out of direct sunlight.
- Should be stored in approved FLAMMABLES cabinet away from oxidizing agents.
- No smoking in storage or use area.
- Not recommended for use or storage in schools without an absolute need being determined. Amounts kept on hand, if any, should be minimal.
- Store to prevent mixing of HCl and HCHO vapors (see above).

SECTION 3. SPILLS AND DISPOSAL PROCEDURES

IF MATERIAL IS SPILLED:

- Confine spills, neutralize with aqueous ammonia or complex with sodium sulfite. Wash residue with dilute ammonia to eliminate vapor.
- Evacuate unnecessary personnel.
- Eliminate all possible sources of ignition. Nearby electrical service and equipment should be explosion proof (no spark-generation potential).
- Provide maximum ventilation.
- Cleanup personnel should have protection against inhalation of vapors (approved respirators) or skin contact with liquid.

DISPOSAL OF SMALL QUANTITIES:

- Neutralized solutions can be disposed of in an approved landfill.
- Keep formalin out of sewage systems and surface waters.
- Small quantities of waste material may be burned in an incinerator if approved methods and applicable regulations are followed.

DISPOSAL OF LARGER AMOUNTS: Contact a licensed disposal company.

*** FOLLOW ALL APPLICABLE LOCAL, STATE, AND FEDERAL REGULATIONS FOR ALL WASTE DISPOSAL ***

SECTION 4: HEALTH HAZARDS

Current ACGIH TLV: 8-hr. TWA: 1 ppm (1.5 mg/m³) (STEL is 2 ppm)
 Current OSHA PEL 8-hr. TWA: 3 ppm (4.5 mg/m³), ceiling = 5 ppm.

ACGIH-suspect human carcinogen.

NTP anticipated human carcinogen.

IARC-human carcinogen.

- Formaldehyde is toxic by inhalation, by repeated or prolonged skin contact, or by ingestion.
- Inhaled vapors (2 to 5 ppm) can be irritating to the eyes, nose, and upper respiratory tract. It can irritate and damage all body tissue it contacts and it can cause allergic sensitization.
- High level exposures (50 to 100 ppm) can cause severe respiratory problems and pulmonary edema.
- Repeated or prolonged contact with skin can cause hardening and cracking.
- Ingestion causes severe acidosis from metabolism of formaldehyde to formic acid resulting in severe stomach pain, nausea, coma, and even death; a mean-lethal dose is about 2 oz. of 37% formalin.

SECTION 5: FIRST AID PROCEDURES**Eye contact:**

- Flush eyes promptly with plenty of running water for at least 15 minutes, including under the eyelids.
- Get prompt medical attention.*

Skin contact:

- Wash exposed areas of skin with soap and water. Remove contaminated clothing; discard contaminated shoes.

Inhalation:

- Remove victim to fresh air; restore and/or support breathing as necessary.
- Get medical help for coughing or breathing difficulty.

Ingestion:

- Get prompt medical attention.*
- Give several glasses of milk or water to drink.
- Induce vomiting -- but ONLY if victim is conscious and alert.*
- Never give anything by mouth to a person who is unconscious or convulsing.
- Combat shock and respiratory failure.

* Get medical help (in school, paramedic, or community) for further treatment, observation, and support after first aid.

SECTION 6: FIRE PROCEDURES AND DATA

- Extinguishing media: Water spray, carbon dioxide, dry chemical, or alcohol type of foam.
- For major fires, or if large quantities of this material are involved, fire fighters should wear appropriate protective clothing and use respiratory protection. Self-contained breathing apparatus is recommended.
- Use of a direct water stream may scatter fire.
- A water spray may be used to cool fire-exposed containers, dilute flammable mixtures and disperse vapors.

37% HCHO	37% HCHO	50% HCHO
1% CH ₃ OH	15% CH ₃ OH	1.5% CH ₃ OH

Three values for three mixtures:

FLASH POINT AND METHOD(S) (TCC)

177°F (80.5°C) 122°F (50°C) 155°F (68.5°C)

AUTOIGNITION TEMPERATURE ... 806°F (430°C)

FLAMMABILITY LIMITS IN AIR (vol. %): (% HCHO by vol.)

Lower ... 7

Upper ... 73

SECTION 7: PHYSICAL DATA

BOILING POINT (@ 1 atm) ... ca 100°C

*SOLUBILITY IN WATER (@ 25°C) ... sol.

*SPECIFIC GRAVITY (25°/25°C) ... 1.11(A); 1.075(B); 1.14 (C)

*NOTE: data applies to the following 3 mixtures (A) 37% HCHO; 1% CH₃OH
 (B) 37% HCHO; 15% CH₃OH
 (C) 50% HCHO; 1.5% CH₃OH

DATA SOURCES: Genium's Industrial MSDS #360 (3/81) and references 2-12, 16, 19, 23-26, 31, 34, 37-39, 501, 505, 509, 511, 518.

(see glossary for tides)

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Approvals:

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Medical Review

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