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6197, 6618, 3935,
4456

FORMALDEHYDE

Material Safety Data Sheet

Emergency Telephone Number
314-982-5000

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Science Products Division
P.O. Box M
Paris, Kentucky 40361

Effective Date: 10-15-86 Supersedes 08-23-85

PRODUCT IDENTIFICATION:

Synonyms: Formaldehyde solution; Formaldehyde 37%; Formalin; Morbicide Acid;

Formula: CAS No.: 50-00-0

Molecular Weight: 30.03

Hazardous Ingredients:

Chemical Formula: CH₂O

CAS # 67-56-1 Methanol (10-15%)
50-50-1 Formaldehyde (37%)

PRECAUTIONARY MEASURES

DANGER! MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. POSSIBLE CANCER HAZARD BASED ON TESTS WITH LABORATORY ANIMALS. EXPOSURE MAY CREATE A CANCER RISK. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. MAY CAUSE BLINDNESS. COMBUSTIBLE.

Keep away from heat, sparks and flame.
Avoid breathing vapor.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.

EMERGENCY/FIRST AID

In all cases call a physician.
If swallowed, induce vomiting immediately by giving two glasses of water and sticking finger down throat. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes.

SEE SECTION 5.

DOT Hazard Class: ORM-A

Physical Data

SECTION 1

Appearance: Clear, colorless liquid.

Odor: Pungent.

Solubility: Infinite in water.

Boiling Point: 96°C (205°F)

Vapor Density (Air=1): 1.04

Melting Point: -15°C (5°F)

Vapor Pressure (mm Hg): No information found.

Specific Gravity (water=1): 1.08

Evaporation Rate: No information found.

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**Fire and Explosion
Information**

SECTION 2

Fire:

Combustible Liquid
Flashpoint: 60°C (140°F) (10% Methanol)
Autoignition temperature: 300°C (572°F)
Flammable limits in air, % by volume:
lsl: 7.0 uel: 73
Gas vaporizes readily from solution and is flammable in air.

Explosion:

Above flash point, vapor-air mixtures are explosive within flammable limits noted above.

Fire Extinguishing Media:

Water spray can be used to extinguish fires and cool fire-exposed containers. Water spray may be used to keep fire exposed containers cool.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Water may be used to flush spills away from exposures and to dilute spills to non-flammable mixtures.

Reactivity Data

SECTION 3

Stability:

Stable under ordinary conditions of use and storage.

**Hazardous Decomposition
Products:**

If involved in a fire, irritating gaseous formaldehyde and carbon monoxide may be released.

Hazardous Polymerization:

Trioxymethylene precipitate can be formed on long standing at very low temperatures. Nonhazardous polymerization may occur at low temperatures, forming paraformaldehyde, a white solid.

Incompatibilities:

Incompatible with oxidizing agents and alkalis. Reacts explosively with nitrogen dioxide at ca. 180°C (356°F). Reacts violently with perchloric acid, perchloric acid-aniline mixtures, and nitromethane. Reaction with hydrochloric acid may form bis-chloromethyl ether, an OSHA regulated carcinogen.

Leak/Spill Disposal Information

SECTION 4

Ventilate area of leak or spill. Remove all sources of ignition. Clean-up personnel require protective clothing and respiratory protection from vapors. Only specially trained or qualified personnel should handle the emergency. Do not flush to sewer or surface waters. Can be absorbed on inert material and disposed as hazardous waste in a RCRA approved facility or dissolved in an appropriate combustible solvent and atomized in a RCRA approved chemical incinerator equipped with an afterburner.

Reportable Quantity (RQ) (CWA/CERCLA): 1000 lbs. Formaldehyde
5000 lbs. Methanol

Ensure compliance with local, state and federal regulations.
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Health Hazard Information

SECTION 3

A. Exposure/Health Effects

Inhalation: May cause sore throat, coughing, and shortness of breath. Causes irritation to the respiratory tract. May be fatal in high concentrations.

Ingestion: Can cause severe abdominal pain, violent vomiting, headache, and diarrhea. Larger doses may produce decreased body temperature, pain in the digestive tract, shallow respiration, weak irregular pulse, unconsciousness and death. Methanol component affects the optic nerve and may cause blindness.

Skin Contact: Toxic. May cause irritation to skin with redness, pain, and possibly burns. Skin absorption may occur with symptoms paralleling those from ingestion.

Eye Contact: Vapors cause irritation to the eyes with redness, pain, and blurred vision. Higher concentrations or splashes may cause irreversible eye damage.

Chronic Exposure: Frequent or prolonged exposure to formaldehyde may cause hypersensitivity leading to contact dermatitis. Repeated or prolonged skin contact with formaldehyde may cause an allergic reaction in some people. Vision impairment and enlargement of liver may occur from methanol component. Formaldehyde is a suspected carcinogen (positive animal inhalation studies).

Aggravation of Pre-existing Conditions: Persons with pre-existing skin disorders or eye problems, or impaired liver, kidney or respiratory function may be more susceptible to the effects of the substance.

B. FIRST AID

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|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Inhalation: | Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician. |
| Ingestion: | If swallowed, induce vomiting immediately by giving two glasses of water and sticking finger down throat. Never give anything by mouth to an unconscious person. Call physician immediately. |
| Skin Exposure: | In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately. |
| Eye Exposure: | Wash eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately. |

C. TOXICITY DATA (RTECS, 1982)

Formaldehyde: Oral rat LD50: 100 mg/kg. Skin rabbit LD50: 270 mg/kg.
Inhalation rat LC50: 590 mg/m³ Mutation references cited.
Reproductive effects cited. Tumorigenic effects cited.
Carcinogenic determination (Formaldehyde gas):
Sufficient evidence in animals - Inadequate evidence in humans
(IARC Supplement 4, 1982 Category 2B)
Listed in the NTP 4th Annual Report on Carcinogens:
May reasonably be anticipated to be a carcinogen.

Methanol: Mutation references cited and reproductive effects cited.

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Occupational Control Measures

SECTION 6

Airborne Exposure Limits:

Formaldehyde:

- OSHA Permissible Exposure Limit (PEL):
3 ppm (TWA); 5 ppm Ceiling; 10 ppm Peak
- ACGIH Threshold Limit Value (TLV):
1 ppm (TWA) 2 ppm (STEL) Listed in Appendix
A2 as Industrial Substances Suspect of Carcinogenic
Potential for Man.

Methanol:

- OSHA Permissible Exposure Limit (PEL):
200 ppm (TWA)
- ACGIH Threshold Limit Value (TLV):
200 ppm (TWA) 250 ppm (STEL) (skin)

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, "Industrial Ventilation, A Manual of Recommended Practices", most recent edition, for details.

**Personal Respirators
(NIOSH Approved)**

If the TLV is exceeded, wear a supplied air, full-facepiece respirator, airlined hood, or self-contained breathing apparatus.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls to prevent skin contact.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Contact lenses should not be worn when working with this material. Maintain eye wash fountain and quick-drench facilities in work area.

Storage and Special Information

SECTION 7

Keep in a tightly closed container. Protect against physical damage. Outside or detached storage is preferred. Inside storage should be in a standard flammable liquids storage room or cabinet. Separate from oxidizing materials. Storage and use areas should be No Smoking areas. Wear special protective equipment (Sec. 6) for maintenance break-in or where exposures may exceed established exposure levels. Wash hands, face, forearms and neck when exiting restricted areas. Shower, dispose of outer clothing, change to clean garments at the end of the day. Avoid cross-contamination of street clothes. Wash hands before eating and do not eat, drink, or smoke in workplace.

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