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# SAFETY DATA SHEETS

According to the UN GHS revision 9

Version: 1.2
Creation Date: July 15, 2019
Revision Date: August 08, 2025

## SECTION 1: Identification

### 1.1 GHS Product identifier

**Product name** Acetaldehyde Solution Certified Reference Material

### 1.2 Other means of identification

**Product number** CPRM3175
**Other names** FORMOL; Acetaldeyde; Acetaldeyd

### 1.3 Recommended use of the chemical and restrictions on use

**Identified uses** For laboratory and Industrial use only.
**Uses advised against** no data available

### 1.4 Supplier's details

**Company** CATO Research Chemicals Inc.
**Address** 3/F,Building B,No.179 BASIGO, Guangpu Rd East,Huangpu Dist,Guangzhou
**Telephone** +86-20-81960175

### 1.5 Emergency phone number

**Emergency phone number** +86-20-81960175
**Service hours** 'Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT +8 hours).

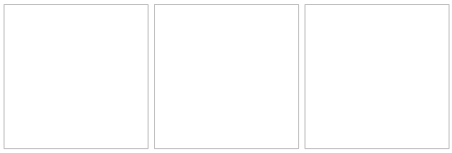
## SECTION 2: Hazard identification

### 2.1 Classification of the substance or mixture

Flammable liquids, Category 1
Eye irritation, Category 2
Specific target organ toxicity – single exposure, Category 3
Germ cell mutagenicity, Category 2
Carcinogenicity, Category 1B

### 2.2 GHS label elements, including precautionary statements

**Pictogram(s)**



**Signal word** Danger
**Hazard statement(s)**
H224 Extremely flammable liquid and vapour
H319 Causes serious eye irritation
H335 May cause respiratory irritation
H341 Suspected of causing genetic defects
H350 May cause cancer

**Precautionary statement(s)**
**Prevention**
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 Keep container tightly closed.
P240 Ground and bond container and receiving equipment.
P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment.
P242 Use non-sparking tools.
P243 Take action to prevent static discharges.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P264 Wash ... thoroughly after handling.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.
P203 Obtain, read and follow all safety instructions before use.

| | |
|---|---|
| **Response** | P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse affected areas with water [or shower].<br>P370+P378 In case of fire: Use ... to extinguish.<br>P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.<br>P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.<br>P319 Get medical help if you feel unwell.<br>P318 IF exposed or concerned, get medical advice. |
| **Storage** | P403+P235 Store in a well-ventilated place. Keep cool.<br>P403+P233 Store in a well-ventilated place. Keep container tightly closed.<br>P405 Store locked up. |
| **Disposal** | P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal. |

### 2.3 Other hazards which do not result in classification

no data available

## SECTION 3: Composition/information on ingredients

### 3.1 Substances

| Chemical name | Common names and synonyms | CAS number | EC number | Concentration |
|---|---|---|---|---|
| Acetaldehyde Solution Certified Reference Material | Acetaldehyde | 75-07-0 | 200-836-8 | 100% |

## SECTION 4: First-aid measures

### 4.1 Description of necessary first-aid measures

**If inhaled**

Fresh air, rest. Refer for medical attention.

**Following skin contact**

Remove contaminated clothes. Rinse and then wash skin with water and soap. Refer for medical attention .

**Following eye contact**

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

**Following ingestion**

Rinse mouth. Give one or two glasses of water to drink. Refer for medical attention .

### 4.2 Most important symptoms/effects, acute and delayed

Breathing vapors will be irritating and may cause nausea, vomiting, headache, and unconsciousness. Contact with eyes may cause burns and eye damage. Skin contact from clothing wet with the chemical causes burns or severe irritation. (USCG, 1999)

### 4.3 Indication of immediate medical attention and special treatment needed, if necessary

Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand-valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR as necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature. Obtain medical attention. Aldehydes and Related Compounds

## SECTION 5: Fire-fighting measures

### 5.1 Suitable extinguishing media

Suitable extinguishing media: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

### 5.2 Specific hazards arising from the chemical

Special Hazards of Combustion Products: Produces irritating vapor when heated Behavior in Fire: Vapors are heavier than air and may travel a considerable distance to a source of ignition and flash back. (USCG, 1999)

### 5.3 Special protective actions for fire-fighters

Use water in large amounts, powder, alcohol-resistant foam, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water.

## SECTION 6: Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

Remove all ignition sources. Evacuate danger area! Personal protection: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations. Do NOT absorb in saw-dust or other combustible absorbents. Remove vapour with fine water spray.

### 6.2 Environmental precautions

Remove all ignition sources. Evacuate danger area! Personal protection: filter respirator for organic gases and vapours adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations. Do NOT absorb in saw-dust or other combustible absorbents. Remove vapour with fine water spray.

### 6.3 Methods and materials for containment and cleaning up

Accidental release measures. Personal precautions, protective equipment and emergency procedures: Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.; Environmental precautions: Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.; Methods and materials for containment and cleaning up: Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations.

## SECTION 7: Handling and storage

### 7.1 Precautions for safe handling

NO open flames, NO sparks and NO smoking. NO contact with hot surfaces. Closed system, ventilation, explosion-proof electrical equipment and lighting. Do NOT use compressed air for filling, discharging, or handling. Use non-sparking handtools. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

### 7.2 Conditions for safe storage, including any incompatibilities

Fireproof. Separated from incompatible materials. See Chemical Dangers. Cooled. Keep in the dark. Store only if stabilized.Conditions for safe storage, including any incompatibilities: Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Recommended storage temperature: 2 - 8 deg C.

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

**Occupational Exposure limit values**

TLV: 25 ppm as STEL; (ceiling value): A3 (confirmed animal carcinogen with unknown relevance to humans).MAK: 91 mg/m3, 50 ppm; peak limitation category: I(1); carcinogen category: 5; pregnancy risk group: C; germ cell mutagen group: 5

**Biological limit values**

no data available

### 8.2 Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

### 8.3 Individual protection measures, such as personal protective equipment (PPE)

**Eye/face protection**

Wear safety goggles or eye protection in combination with breathing protection.

**Skin protection**

Protective gloves.

**Respiratory protection**

Use ventilation. Use local exhaust or breathing protection.

**Thermal hazards**

no data available

## SECTION 9: Physical and chemical properties and safety characteristics

| | |
|---|---|
| **Physical state** | Liquid. Liquid. |
| **Colour** | Colorless. |
| **Odour** | Pungent, fruity odor |
| **Melting point/freezing point** | -123.5 °C. |
| **Boiling point or initial boiling point and boiling range** | 20.2 °C. Atm. press.:101.3 kPa. |
| **Flammability** | Class IA Flammable Liquid: Fl.P. below 73°F and BP below 100°F. |
| **Lower and upper explosion limit/flammability limit** | Lower flammable limit: 4.0% by volume; Upper flammable limit: 60% by volume |
| **Flash point** | -38.89 °C.;-40 °C. |
| **Auto-ignition temperature** | 175 °C. Atm. press.:1 013 hPa. |
| **Decomposition temperature** | no data available |
| **pH** | no data available |

| | |
|---|---|
| **Kinematic viscosity** | 0.253 mPa s at 9.5 deg C; 0.21 mPa s at 20 deg C |
| **Solubility** | Miscible with water |
| **Partition coefficient n-octanol/water** | log Pow = 0.63. Remarks:No further data published. |
| **Vapour pressure** | 120.2 kPa. Temperature:25 °C. Remarks:(902 mm Hg at 25°C). |
| **Density and/or relative density** | 0.785 g/cm³. Temperature:18 °C. |
| **Relative vapour density** | 1.03 (vs air) |
| **Particle characteristics** | no data available |

## SECTION 10: Stability and reactivity

### 10.1 Reactivity

NIOSH considers acetaldehyde to be a potential occupational carcinogen.
Contact with air generates explosive peroxides. The substance may polymerize under the influence of acids and alkaline hydroxides in the presence of trace metals (iron). This generates fire and explosion hazard. The substance is a strong reducing agent. It reacts violently with oxidants, strong acids, halogens and amines. This generates fire or explosion hazard.

### 10.2 Chemical stability

Avoid exposure to air any longer than necessary so as to prevent peroxide formation. Stable under recommended storage conditions. Test for peroxide formation before distillation or evaporation. Test for peroxide formation or discard after 1 year.

### 10.3 Possibility of hazardous reactions

Highly flammable liquid.The vapour is heavier than air and may travel along the ground; distant ignition possible.ACETALDEHYDE undergoes a vigorously exothermic condensation reaction in contact with strong acids, bases or traces of metals. Can react vigorously with oxidizing reagents such as dinitrogen pentaoxide, hydrogen peroxide, oxygen, silver nitrate, etc. Contamination often leads either to reaction with the contaminant or polymerization, both with the evolution of heat. Can react violently with acid anhydrides, alcohols, ketones, phenols, ammonia, hydrogen cyanide, hydrogen sulfide, halogens, phosphorus, isocyanates, concentrated sulfuric acid, and aliphatic amines. Reactions with cobalt chloride, mercury(II) chlorate or perchlorate form sensitive, explosive products [Sax, 9th ed., 1996, p. 5]. An oxygenation reaction of acetaldehyde in the presence of cobalt acetate at -20°C exploded violently when stirred. The event was ascribed to peroxyacetate formation [Phillips B. et al., J. Am. Chem. Soc., 1957, 79, p. 5982].

### 10.4 Conditions to avoid

no data available

### 10.5 Incompatible materials

Incompatible materials: Oxidizing agents, reducing agents, acids, nitric acid, peroxides, bases, sodium hydroxide, amines, ammonia, oxygen. Warning: Acetaldehyde is oxidized rapidly and exothermically by air, to acetic acid, acid anhydrides, alcohols, halogens, ketones, phenol, hydrogen sulfide gas, hydrogen peroxide.

### 10.6 Hazardous decomposition products

Decomposes above 400 deg C to form ... methane & carbon monoxide.

## SECTION 11: Toxicological information

**Acute toxicity**

- Oral: NOEL - rat (male/female) - 125 mg/kg bw.
- Inhalation: LC50 Rat inhalation 37 g/cu m/30 min
- Dermal: no data available

**Skin corrosion/irritation**

no data available

**Serious eye damage/irritation**

no data available

**Respiratory or skin sensitization**

no data available

**Germ cell mutagenicity**

no data available

**Carcinogenicity**

Acetaldehyde is reasonably anticipated to be a human carcinogen based on sufficient evidence of carcinogenicity from studies in experimental animals.

**Reproductive toxicity**

No information is available on the reproductive or developmental effects of acetaldehyde in humans. Acetaldehyde has been shown, in animals, to cross the placenta to the fetus. Data from animal studies suggest that acetaldehyde may be a potential developmental toxin. In one study, a high incidence of embryonic resorptions was observed in mice injected with acetaldehyde. In rats exposed to acetaldehyde by injection, skeletal malformations, reduced birth weight, and increased postnatal mortality have been reported.

**STOT-single exposure**

The substance is mildly irritating to the eyes, skin and respiratory tract. The substance may cause effects on the central nervous system.

**STOT-repeated exposure**

Repeated or prolonged contact with skin may cause dermatitis. The substance may have effects on the respiratory tract. This may result in tissue lesions. This substance is possibly carcinogenic to humans.

**Aspiration hazard**

A harmful contamination of the air can be reached very quickly on evaporation of this substance at 20°C.

## SECTION 12: Ecological information

### 12.1 Toxicity

- Toxicity to fish: LC50 - Pimephales promelas - 30.8 mg/L - 96 h.
- Toxicity to daphnia and other aquatic invertebrates: EC50 - Daphnia magna - ca. 48.3 mg/L - 48 h.
- Toxicity to algae: EC50 - Nitscheria linearis - >= 237 - <= 249 mg/L - 5 d.
- Toxicity to microorganisms: no data available

### 12.2 Persistence and degradability

AEROBIC: Acetaldehyde, present at 100 mg/L, reached 80% of its theoretical BOD in 2 weeks using an activated sludge inoculum at 30 mg/L and the Japanese MITI test which classified the compound as readily biodegradable(1). Acetaldehyde was also easily biodegraded by biological sewage treatment(2). Other laboratory screening tests confirm the biodegradability of acetaldehyde by acclimated sludge and sewage(3-7) with theoretical BODs of 28% in 24 hr(3), 100% in 5 hr(4), 40.5% in 5 days(8), and 70% in 5 days(5). Acetaldehyde was oxidized in a silty clay loam but no rates were given(9). In a die-away test in seawater, acetaldehyde concentrations declined to approximately 25% of initial values in 1 hr, whereas no decline in concentration was observed in sterile controls(10).

### 12.3 Bioaccumulative potential

An estimated BCF of 3 was calculated in fish for acetaldehyde(SRC), using a log Kow of -0.34(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC).

### 12.4 Mobility in soil

Using a structure estimation method based on molecular connectivity indices(1), the Koc of acetaldehyde can be estimated to be 1(SRC). According to a classification scheme(2), this estimated Koc value suggests that acetaldehyde is expected to have very high mobility in soil.

### 12.5 Other adverse effects

no data available

## SECTION 13: Disposal considerations

### 13.1 Disposal methods

**Product**

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

**Contaminated packaging**

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

## SECTION 14: Transport information

### 14.1 UN Number

| | | |
|---|---|---|
| ADR/RID: UN1089 (For reference only, please check.) | IMDG: UN1089 (For reference only, please check.) | IATA: UN1089 (For reference only, please check.) |

### 14.2 UN Proper Shipping Name

| | | |
|---|---|---|
| ADR/RID: ACETALDEHYDE (For reference only, please check.) | IMDG: ACETALDEHYDE (For reference only, please check.) | IATA: ACETALDEHYDE (For reference only, please check.) |

### 14.3 Transport hazard class(es)

| | | |
|---|---|---|
| ADR/RID: 3 (For reference only, please check.) | IMDG: 3 (For reference only, please check.) | IATA: 3 (For reference only, please check.) |

### 14.4 Packing group, if applicable

| | | |
|---|---|---|
| ADR/RID: I (For reference only, please check.) | IMDG: I (For reference only, please check.) | IATA: I (For reference only, please check.) |

### 14.5 Environmental hazards

| | | |
|---|---|---|
| ADR/RID: No | IMDG: No | IATA: No |

### 14.6 Special precautions for user

no data available

### 14.7 Transport in bulk according to IMO instruments

no data available

## SECTION 15: Regulatory information

### 15.1 Safety, health and environmental regulations specific for the product in question

| Chemical name | Common names and synonyms | CAS number | EC number |
|---|---|---|---|
| Acetaldehyde | Acetaldehyde | 75-07-0 | 200-836-8 |
| **European Inventory of Existing Commercial Chemical Substances (EINECS)** | | | Listed. |
| **EC Inventory** | | | Listed. |
| **United States Toxic Substances Control Act (TSCA) Inventory** | | | Listed. |
| **China Catalog of Hazardous chemicals 2015** | | | Listed. |
| **New Zealand Inventory of Chemicals (NZIoC)** | | | Listed. |
| **Philippines Inventory of Chemicals and Chemical Substances (PICCS)** | | | Listed. |
| **Vietnam National Chemical Inventory** | | | Listed. |
| **Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)** | | | Listed. |
| **Korea Existing Chemicals List (KECL)** | | | Listed. |

## SECTION 16: Other information

**Information on revision**

| | |
|---|---|
| **Creation Date** | July 15, 2019 |
| **Revision Date** | August 08, 2025 |

**Abbreviations and acronyms**

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

**References**

- IPCS - The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home
- HSDB - Hazardous Substances Data Bank, website: https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm
- IARC - International Agency for Research on Cancer, website: http://www.iarc.fr/
- eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
- CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple
- ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp
- ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: http://www.phmsa.dot.gov/hazmat/library/erg
- Germany GESTIS-database on hazard substance, website: http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp
- ECHA - European Chemicals Agency, website: https://echa.europa.eu/

**Other Information**

Depending on the degree of exposure, periodic medical examination is suggested.The occupational exposure limit value should not be exceeded during any part of the working exposure.An added stabilizer or inhibitor can influence the toxicological properties of this substance; consult an expert.Rinse contaminated clothing with plenty of water because of fire hazard.

**Any questions regarding this SDS, Please send your inquiry to info@cato-chem.com**

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