

SAFETY DATA SHEETS

According to Globally Harmonized System of Classification and Labelling of Chemicals (GHS) - Sixth revised edition

Version: 1.0

Creation Date: Aug 11, 2017

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1. Identification

1.1 GHS Product identifier

Product name chloral hydrate

1.2 Other means of identification

Product number -

Other names Trichloroacetaldehyde Hydrate

1.3 Recommended use of the chemical and restrictions on use

Identified uses For industry use only.

Uses advised against no data available

2. Hazard identification

2.1 Classification of the substance or mixture

Acute toxicity - Oral, Category 3

Skin irritation, Category 2

Eye irritation, Category 2

2.2 GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

Hazard statement(s)	<p>H301 Toxic if swallowed</p> <p>H315 Causes skin irritation</p> <p>H319 Causes serious eye irritation</p>
Precautionary statement(s) Prevention	<p>P264 Wash ... thoroughly after handling.</p> <p>P270 Do not eat, drink or smoke when using this product.</p> <p>P280 Wear protective gloves/protective clothing/eye protection/face protection.</p>
Response	<p>P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor/...</p> <p>P321 Specific treatment (see ... on this label).</p> <p>P330 Rinse mouth.</p> <p>P302+P352 IF ON SKIN: Wash with plenty of water/...</p> <p>P332+P313 If skin irritation occurs: Get medical advice/attention.</p> <p>P362+P364 Take off contaminated clothing and wash it before reuse.</p> <p>P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.</p> <p>P337+P313 If eye irritation persists: Get medical advice/attention.</p>
Storage	<p>P405 Store locked up.</p>
Disposal	<p>P501 Dispose of contents/container to ...</p>

2.3 Other hazards which do not result in classification

none

3. Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
chloral hydrate	chloral hydrate	302-17-0	none	100%

4. First-aid measures

4.1 Description of necessary first-aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled

Fresh air, rest. Artificial respiration may be needed. Refer immediately for medical attention.

In case of skin contact

Rinse skin with plenty of water or shower.

In case of eye contact

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

If swallowed

Rinse mouth. Do NOT induce vomiting. Refer immediately for medical attention.

4.2 Most important symptoms/effects, acute and delayed

SYMPTOMS: Symptoms of exposure to this compound include general anesthesia, cardiac arrhythmias and blood pressure depression. Other symptoms include hemorrhagic gastritis, enteritis, central nervous system depression, coma, severe respiratory depression, ventricular tachycardia and cardiac arrest. Dermatitis, swelling of the lids, hyperemia, edema of the conjunctiva and a sensation of irritation and tearing may also occur. Exposure may result in gastric irritation, rapid circulatory collapse, kidney and liver damage, heart damage, psychosis and leukopenia. Flatulence, abdominal distension, nausea, headache, giddiness, rashes and blood dyscrasias can occur. **ACUTE/CHRONIC HAZARDS:**

This compound is an irritant of the skin and eyes. When heated to decomposition it emits toxic fumes of chlorine.

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

Maintain an open airway and assist ventilation if necessary. Administer supplemental oxygen. Treat coma, hypothermia, hypotension, and pulmonary edema if they occur. Monitor patients for at least 6 hours after ingestion, because delayed absorption may occur. Patients with chloral hydrate ingestion should be monitored 18 to 24 hours because of the risk of cardiac arrhythmias. Tachyarrhythmias caused by myocardial sensitization may be treated with propranolol or esmolol. ... Administer activated charcoal orally if conditions are appropriate. Gastric lavage is not necessary after small to moderate ingestions if activated charcoal can be given promptly. ... /Sedative-Hypnotic Agents/

5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

Fires involving this material can be controlled with a dry chemical, carbon dioxide or Halon extinguisher.

5.2 Specific hazards arising from the chemical

Flash point data for this chemical are not available; however, it is probably combustible.

5.3 Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust. For personal protection see section 8.

6.2 Environmental precautions

Personal protection: particulate filter respirator adapted to the airborne concentration of the substance. Sweep spilled substance into covered containers. If appropriate, moisten first to prevent dusting. Carefully collect remainder. Then store and dispose of according to local regulations.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal. Sweep up and shovel. Keep in suitable, closed containers for disposal.

7. Handling and storage

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Avoid exposure - obtain special instructions before use. Provide appropriate exhaust ventilation at places where dust is formed. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Separated from strong bases and food and feedstuffs. Chloral hydrate oral solution should be stored in tight, light-resistant containers. Chloral hydrate capsules should be stored at 15-30°C.

8. Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

no data available

Biological limit values

no data available

8.2 Appropriate engineering controls

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

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

Eye/face protection

Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Wear impervious clothing. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace. Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

Wear dust mask when handling large quantities.

Thermal hazards

no data available

9. Physical and chemical properties

Physical state	white crystalline powde
Colour	COLORLESS OR WHITE CRYSTALS
Odour	Aromatic, penetrating and slightly acrid odor
Melting point/ freezing point	19°C(lit.)
Boiling point or initial boiling point and boiling range	57°C(lit.)
Flammability	Not combustible. Gives off irritating or toxic fumes (or gases) in a fire.
Lower and upper explosion limit / flammability limit	no data available
Flash point	-16°C(lit.)
Auto-ignition temperature	no data available
Decomposition temperature	97°C
pH	3.5-4.4 (10% soln in water)

Kinematic viscosity	no data available
Solubility	In water:660 g/100 mL
Partition coefficient n-octanol/water (log value)	no data available
Vapour pressure	5 mm Hg at 10°C ; 10 mm Hg at 19.5°C; 60 mm Hg at 46.22°C
Density and/or relative density	1.908
Relative vapour density	5.1 (Air= 1)
Particle characteristics	no data available

10. Stability and reactivity

10.1 Reactivity

no data available

10.2 Chemical stability

SLOWLY VOLATILIZES ON EXPOSURE TO AIR.

10.3 Possibility of hazardous reactions

Combustible when exposed to heat or flame. CHLORAL HYDRATE is incompatible with alkalis, alkaline earth metals, alkali carbonates and soluble barbiturates. It is decomposed by sodium hydroxide. It reduces ammoniacal silver nitrate. It liquefies when triturated with an equal quantity of menthol, camphor or thymol. . Reaction of chloral hydrate with hydroxylamine produces toxic hydrogen cyanide gas, Org. Synth., 1941, Vol. 1, 377.

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

no data available

10.6 Hazardous decomposition products

When heated to decomposition it emits toxic fumes of /hydrogen chloride/.

11. Toxicological information

Acute toxicity

- Oral: LD50 Rat oral 200-500 mg/kg
- Inhalation: no data available
- 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

WEIGHT-OF-EVIDENCE CHARACTERIZATION: Under the 1986 cancer guidelines (EPA), chloral hydrate is assigned to Group C, possible human carcinogen. Under the 1996 proposed guidelines (EPA) for carcinogen risk assessment, chloral hydrate shows suggestive evidence of human carcinogenicity by the oral route of exposure. There are no carcinogenicity data from humans. Two bioassays in rats in which chloral hydrate was administered by drinking water show no increase in tumors at any site. Because only minimal toxicity was observed in the livers of the rats in these bioassays, the tests were not conducted at the maximum tolerated dose. A chronic bioassay in female mice showed a slight increase in the severity grade of hyperplasia and a slight increase in the incidence of adenoma in the pituitary gland pars distalis at the highest exposure tested. There is some evidence that chloral hydrate causes hepatocellular tumors in male mice. An earlier study showing an increase of hepatocellular adenomas or trabecular carcinomas following a single bolus exposure could not be confirmed in a study using more animals and higher exposures. Three separate 2-year bioassays in male mice show an increased incidence of hepatocellular adenoma or carcinoma. There are no data identifying a lesion that is a precursor to the hepatocellular tumors. The strain of mice used has a very high spontaneous incidence of hepatocellular tumors. Two of the metabolites of chloral hydrate, trichloroacetic acid and dichloroacetic acid, have been shown to cause hepatocellular tumors in rodents. Trichloroacetic acid causes hepatocellular tumors only in mice. Dichloroacetic acid causes hepatocellular tumors in both rats and mice. There is

an extensive database on genetic toxicity. A variety of results show that chloral hydrate is a weak gene mutagen and clastogen. Chloral hydrate induces aneuploidy in a wide variety of cell types. These latter effects are thought to arise by disruption of the spindle apparatus. A high concentration of chloral hydrate is required to cause observable effects. Although these data suggest that genotoxicity may play a role in the toxicity of chloral hydrate, the data indicate that these effects require concentrations that are unlikely to occur under physiological conditions at the exposures typically encountered from the environment. Collectively, these data provide suggestive evidence of carcinogenicity, but the weight of evidence is not sufficient to conduct a risk assessment assuming a linear response at low exposure. HUMAN CARCINOGENICITY DATA: None. ANIMAL CARCINOGENICITY DATA: Limited.

Reproductive toxicity

no data available

STOT-single exposure

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

12. Ecological information

12.1 Toxicity

- Toxicity to fish: no data available
- Toxicity to daphnia and other aquatic invertebrates: EC50; Species: Daphnia magna (Water flea); Conditions: freshwater; pH 8; Concentration: 630 mg/L for 24 hr; Effect: behavior, equilibrium /Conditions of bioassay not specified in source examined
- Toxicity to algae: no data available
- Toxicity to microorganisms: no data available

12.2 Persistence and degradability

AEROBIC: Biodegradation data for chloral hydrate were not available(1).

12.3 Bioaccumulative potential

An estimated BCF of 3 was calculated in fish for chloral hydrate(SRC), using a log Kow of 0.99(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

The Koc of chloral hydrate is estimated as 82(SRC), using a log Kow of 0.99(1) and a regression-derived equation(2). According to a classification scheme(3), this estimated Koc value suggests that chloral hydrate is expected to have high mobility in soil.

12.5 Other adverse effects

no data available

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.

14. Transport information

14.1 UN Number

ADR/RID: UN2811

IMDG: UN2811

IATA: UN2811

14.2 UN Proper Shipping Name

ADR/RID: TOXIC SOLID, ORGANIC, N.O.S.

IMDG: TOXIC SOLID, ORGANIC, N.O.S.

IATA: TOXIC SOLID, ORGANIC, N.O.S.

14.3 Transport hazard class(es)

ADR/RID: 6.1

IMDG: 6.1

IATA: 6.1

14.4 Packing group, if applicable

ADR/RID: III

IMDG: III

IATA: III

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 Annex II of MARPOL 73/78 and the IBC Code

no data available

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
chloral hydrate	chloral hydrate	302-17-0	none
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			Not Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Not Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Listed.

16. Other information

Information on revision

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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/>
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