



SAFETY DATA SHEET

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200) (OSHA HCS)

SECTION 1. IDENTIFICATION

Product name : 4-Chloro-1-butanol (contains varying amounts of Tetrahydrofuran)
Product code : C0144

Manufacturer or supplier's details

Company name of supplier : TCI America
Address : 9211 N. Harborside Street Portland, OR 97203 U.S.A.
Telephone : +1-800-4238616/+1-503-2831681
Telefax : +1-888-5201075/+1-503-2831987
E-mail address : sales-US@TCIchemicals.com

Chemical Emergencies: TCI America (8:00am - 5:00pm) PST +1-503-2867624

Transportation Emergencies: Chemtrec 24-Hour +1-800-4249300 (U.S.A.)/+1-703-5273887 (International)

Recommended use of the chemical and restrictions on use

Recommended use : Use as laboratory reagent

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Flammable liquids : Category 3
Acute toxicity (Oral) : Category 4
Skin irritation : Category 2
Eye irritation : Category 2A
Carcinogenicity : Category 2
Specific target organ toxicity - single exposure : Category 2 (Nervous system)
Specific target organ toxicity - repeated exposure : Category 1 (Liver, Nervous system, Kidney)

GHS label elements

Hazard pictograms :



Signal Word : Danger

Hazard Statements : H226 Flammable liquid and vapor.
H302 Harmful if swallowed.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H351 Suspected of causing cancer.
H371 May cause damage to organs (Nervous system).
H372 Causes damage to organs (Liver, Nervous system, Kidney) through prolonged or repeated exposure.

Precautionary Statements : **Prevention:**
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P210 Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P260 Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.

P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.

P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308 + P311 IF exposed or concerned: Call a POISON CENTER/ doctor.

P308 + P313 IF exposed or concerned: Get medical advice/ attention.

P332 + P313 If skin irritation occurs: Get medical advice/ attention.

P337 + P313 If eye irritation persists: Get medical advice/ attention.

P362 Take off contaminated clothing and wash before reuse.

P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Storage:

P403 + P235 Store in a well-ventilated place. Keep cool.

P405 Store locked up.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Substance

Components

Chemical name	CAS RN	Concentration (% w/w)
4-Chloro-1-butanol	928-51-8	>= 70 - < 90
Tetrahydrofuran	109-99-9	>= 5 - < 10

Actual concentration is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

If inhaled : Remove person to fresh air and keep comfortable for breathing. Get medical advice/ attention if you feel unwell.

In case of skin contact : Take off all contaminated clothing immediately. If on skin, rinse well with water. If skin irritation or rash occurs: Get medical advice/ attention.

In case of eye contact : Rinse with plenty of water. If easy to do, remove contact lens, if worn. If eye irritation persists: Get medical advice/ attention.

If swallowed : Get medical advice/ attention. Rinse mouth.

Most important symptoms and effects, both acute and delayed : None known.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media : Dry powder, Foam, Water spray, Carbon dioxide (CO2)

Specific hazards during fire fighting : No information available.

Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Immediately evacuate personnel to safe areas. Remove undamaged containers from fire area if it is safe to do so.

Special protective equipment for fire-fighters : Use personal protective equipment.

SECTION 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Wear suitable protective equipment. Keep people away from and up-wind of spill/leak. Ensure adequate ventilation. Entry to non-involved personnel should be controlled around the leakage area by roping off, etc.
- Environmental precautions : Prevent product from entering drains.
- Methods and materials for containment and cleaning up : Collect as much of the spill as possible with a suitable absorbent material.

SECTION 7. HANDLING AND STORAGE

- Technical measures : Prevent generation of vapor or mist. Take precautionary measures against static discharge. Use explosion-proof equipment.
- Local/Total ventilation : Ensure adequate ventilation. Handle product only in closed system or provide appropriate exhaust ventilation at machinery. Use a local exhaust ventilation.
- Advice on safe handling : Avoid contact with skin, eyes and clothing. Wear personal protective equipment. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Do not subject to grinding, shock or friction. Wash hands and face thoroughly after handling.
- Conditions for safe storage : Keep container tightly closed. Store in a freezer. Keep in a well-ventilated place. Use explosion-proof equipment. Keep under inert gas. Store locked up.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS RN	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Tetrahydrofuran	109-99-9	TWA	50 ppm	ACGIH
		STEL	100 ppm	ACGIH
		ST	250 ppm 735 mg/m ³	NIOSH REL
		TWA	200 ppm 590 mg/m ³	NIOSH REL
		TWA	200 ppm 590 mg/m ³	OSHA Z-1
		TWA	200 ppm 590 mg/m ³	OSHA P0
		STEL	250 ppm 735 mg/m ³	OSHA P0

Biological occupational exposure limits

Components	CAS RN	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
Tetrahydrofuran	109-99-9	Tetrahydrofuran	Urine	End of shift (As soon as possible after exposure ceases)	2 mg/l	ACGIH BEI

- Engineering measures** : Install a closed system or local exhaust. Also install safety shower and eye bath.

Personal protective equipment

- Respiratory protection : Gas mask, Self-contained breathing apparatus
- Hand protection : Impervious gloves
- Eye protection : Safety glasses, Safety goggles, Face-shield
- Skin and body protection : Impervious protective clothing

*Use personal protective equipment (PPE) approved under appropriate government standards and follow local and national regulations.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: liquid
Color	: colorless - yellow
Odor	: No data available
Odor Threshold	: No data available
pH	: No data available
Melting point/freezing point	: No data available
Boiling point/boiling range	: 126 °F / 52 °C(1 hPa)
Flash point	: 97 °F / 36 °C
Flammability (solid, gas)	: No data available
Upper explosion limit / Upper flammability limit	: No data available
Lower explosion limit / Lower flammability limit	: No data available
Vapor pressure	: No data available
Relative vapor density	: No data available
Relative density	: 1.09
Solubility(ies)	: No data available
Solubility in other solvents	: No data available
Partition coefficient: n-octanol/water	: No data available
Autoignition temperature	: No data available
Decomposition temperature	: No data available
Viscosity	
Viscosity, dynamic	: No data available
Viscosity, kinematic	: No data available
Molecular weight	: 108.57 g/mol

SECTION 10. STABILITY AND REACTIVITY

Reactivity	: No data available
Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	: None under normal processing.
Conditions to avoid	: Heat. Electrical spark Open flame Electrostatic discharge Exposure to air.
Incompatible materials	: Oxidizing agents
Hazardous decomposition products	: Carbon monoxide, Carbon dioxide (CO ₂), Hydrogen chloride gas

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Acute oral toxicity	: LD50 (Mouse): 990 mg/kg
Acute toxicity (other routes of administration)	: LD50 (Mouse): > 100 mg/kg Application Route: Intraperitoneal injection
Acute oral toxicity	: LD50 (Rat): 1,650 mg/kg
Acute inhalation toxicity	: LC50 (Rat): 21000 ppm Exposure time: 3 h Test atmosphere: gas
Acute toxicity (other routes of administration)	: LD50 (Rat): 2,900 mg/kg Application Route: Intraperitoneal injection

Skin corrosion/irritation

Result	: Skin irritation
Result	: Skin irritation

Serious eye damage/eye irritation

Result	: Eye irritation
Result	: Eye irritation

Respiratory or skin sensitization	: No information available.
Germ cell mutagenicity	: No information available.
Carcinogenicity	

Carcinogenicity - Assessment	: Suspected human carcinogens
IARC	Group 2B: Possibly carcinogenic to humans
	Tetrahydrofuran 109-99-9
OSHA	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.
NTP	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
Reproductive toxicity	: No information available.
STOT-single exposure	
Assessment	: May cause respiratory irritation.
Target Organs	: Nervous system
Assessment	: May cause damage to organs.
STOT-repeated exposure	
Target Organs	: Liver, Nervous system, Kidney
Assessment	: Causes damage to organs through prolonged or repeated exposure.
Repeated dose toxicity	: No information available.
Aspiration toxicity	: No information available.
RTECS No.	: EL1325000 (4-Chloro-1-butanol) LU5950000 (Tetrahydrofuran)

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity	
Toxicity to fish	: LC50 (Pimephales promelas (fathead minnow)): 2,160 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): 5,930 mg/l Exposure time: 24 h
Persistence and degradability	
Biodegradability	: Biochemical oxygen demand Result: Readily biodegradable. Biodegradation: 100 %
Bioaccumulative potential	
Partition coefficient: n-octanol/water	: 0.46
Mobility in soil	
Distribution among environmental compartments	: Koc: 18 - 23
Other adverse effects	
Product:	
Ozone-Depletion Potential	: Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods	
Waste from residues	: Disposal in accordance with local and national regulations. Take precautions against ignition or explode. Entrust disposal to a licensed waste disposal company.
Contaminated packaging	: Disposal in accordance with local and national regulations. Before disposal of used container, remove contents completely.

SECTION 14. TRANSPORT INFORMATION**International Regulations****IATA-DGR**

UN/ID No. : UN 1993
Proper shipping name : Flammable liquid, n.o.s.
Class : 3
Packing group : III

IMDG-Code

UN number : UN 1993
Proper shipping name : FLAMMABLE LIQUID, N.O.S.
Class : 3
Packing group : III
EmS Code : F-E, S-E
Marine pollutant : no

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

Domestic regulation**49 CFR**

UN/ID/NA number : UN 1993
Proper shipping name : Flammable liquids, n.o.s.
Class : 3
Packing group : III
ERG Code : 128
Marine pollutant : no

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION**CERCLA Reportable Quantity**

Components	CAS RN	Component RQ (lbs)	Calculated product RQ (lbs)
Tetrahydrofuran	109-99-9	1000	*

*: Calculated RQ exceeds reasonably attainable upper limit.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : No SARA Hazards

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Air Act

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCM I Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307

This product does not contain any priority pollutants related to the U.S. Clean Water Act

US State Regulations

Massachusetts Right To Know

Tetrahydrofuran	109-99-9
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Pennsylvania Right To Know

4-Chloro-1-butanol	928-51-8
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Tetrahydrofuran	109-99-9
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Maine Chemicals of High Concern

Product does not contain any listed chemicals

Vermont Chemicals of High Concern

Product does not contain any listed chemicals

Washington Chemicals of High Concern

Product does not contain any listed chemicals

California List of Hazardous Substances

Tetrahydrofuran	109-99-9
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California Permissible Exposure Limits for Chemical Contaminants

Tetrahydrofuran	109-99-9
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TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

SECTION 16. OTHER INFORMATION

Revision Date : 12/09/2024

This SDS was prepared sincerely based on the information obtained, however, any warranty shall not be given regarding the data contained and the assessment of hazards and toxicity. Prior to use, please investigate not only the hazards and toxicity information but also the laws and regulations of the organization, area and country where the products are to be used, which shall be given the first priority. The products are supposed to be used promptly after purchase in consideration of safety. Some new information or amendments may be added afterwards. If the products are to be used far behind the expected time of use or you have any questions, please feel free to contact us. The stated cautions are for normal handling only. In case of special handling operations, sufficient care should be taken, in addition to the safety measures suitable for the given situation. All chemical products should be treated with the recognition of "having unknown hazards and toxicity", which differ greatly depending on the conditions and handling when in use and/or the conditions and duration of storage. The products must be handled only by those who are familiar with specialized knowledge and have experience or under the guidance of those specialists throughout use from opening to storage and disposal. Safe usage conditions shall be set up on each user's own responsibility.