

SAFETY DATA SHEET

SDS No.1021-31309

Revised date June 6, 2019

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1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : Ethylene Oxide 100ppm in Ethanol
NAME OF SPPLIER : GL Sciences Inc.
ADDRESS : 22-1 Nishishinjuku 6-chome Shinjuku-ku Tokyo 163-1130, Japan
CHARGE SECTION : International Sales Section
TELEPHONE No. : +81-3-5323-6620
FACSIMILE No. : +81-3-5323-6621
PRODUCT No. : 1021-31309
SDS No. : 1021-31309
Research use only.

2. HAZARDS IDENTIFICATION

GHS CLASSIFICATION : Flammable liquid : Category 2
Serious eye damage/eye irritation : Category 2A
Carcinogenicity : Category 1A
Reproductive toxicity : Category 1A
Specific target organ toxicity
(Single exposure) : Category 3 (respiratory tract irritation,
narcotic effects)
Specific target organ toxicity
(Repeated exposure) : Category 1 (liver)
: Category 2 (central nervous system)

HAZARD SYMBOL :



SIGNAL WORD : Danger

HAZARD STATEMENTS :

H225 Highly flammable liquid and vapor
H319 Cause serious eye irritation
H350 May cause cancer
H360 May damage fertility or the unborn child
H335 May cause respiratory irritation
H336 May cause drowsiness or dizziness
H372 Cause damage to liver through prolonged or repeated exposure
H373 May cause damage to central nervous system through prolonged or repeated exposure

PRECAUTIONARY STATEMENTS :

[Prevention]

P202 Do not handle until all safety precautions have been read and understood.
P210 Keep away from heat, hot surface, 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 equipment.
P242 Use non-sparking tools.
P243 Take action to prevent static discharges.
P260 Do not breathing dust/fume/gas/mist/vapours/spray.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P271 Use only outdoors or in a well-ventilated area.
P264 Wash hands thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.

[Response]

- P303+P361+P353 IF ON SKIN or hair: Take off immediately all contaminated clothing. Rinse skin with water.
- 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+P313 IF exposed or concerned: Get medical attention.
- P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
- P314 Get medical attention if you feel unwell.
- P337+P313 If eye irritation persists: Get medical attention.
- P370+P378 In case of fire: Use appropriate medias to extinguish.

[Storage]

- P403+ P233+P235 Store in a well-ventilated place. Keep container tightly closed. Keep cool.
- P405 Store locked up.

[Disposal]

- P501 Dispose of contents/container in accordance with all applicable regulations.

3. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL IDENTITY : Mixture

CHEMICAL NAME	CONTENT	CHEMICAL FORMULA	CAS RN	TSCA INVENTORY	EINECS No.
Ethanol	> 99 %	C ₂ H ₅ OH	64-17-5	Listed	200-578-6
Ethylene Oxide	0.01 %	C ₂ H ₄ O	75-21-8	Listed	200-849-9

4. FIRST AID MEASURES

- GENERAL ADVICE : Consult a physician. Show this safety data sheet to the doctor in attendance.
- INHALATION : Move victim to fresh air. If breathing is difficult, give oxygen.
If irritation persists, consult a physician.
- SKIN CONTACT : Remove contaminated clothes and shoes, rinse skin with plenty of water or shower. Use soap to help assure removal. Consult a physician immediately.
- EYE CONTACT : Flush eyes well with flooding large amounts of running water for at least 15 minutes. Assure adequate flushing by separating the eyelids with sterile fingers. If possible, remove any contact lenses. Consult a physician immediately.
- INGESTION : Rinse mouth, give plenty of water to dilute the substance. Do not induce vomiting. Never give anything by mouth to an unconscious person. Consult a physician immediately.
- GENERAL ADVICE : Wash off immediately with soap and plenty of water. In the case of respirable dust and/or fumes, use self-contained breathing apparatus and dust impervious protective suit. Use personal protective equipment.

5. FIRE FIGHTING MEASURES

- EXTINGUISHING MEDIA : Carbon dioxide, dry chemical powder, foam, water spray
- FIRE & EXPLOSION HAZARDS : Toxic, irritating, dust/fume/smoke may be emitted. Carbon monoxide may be foamed.
- SPECIAL PROTECTIVE EQUIPMENT
FOR FIRE FIGHTERS : Firemen should wear normal protective equipment(full bunker gear) and positive-pressure self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

- PERSONAL PRECAUTIONS : Remove ignition sources and ventilate the area. In case of insufficient ventilation, wear suitable respiratory equipment. Avoid raising dust and avoid contact with skin and eyes.
- 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 FOR CLEAN UP : Do not touch spilled material without suitable protection. Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

- HANDLING** : Keep away from ignition sources and ventilate the area – No smoking. In case of insufficient ventilation, wear suitable respiratory equipment.
 Avoid contact with eyes, skin, and clothing. Avoid inhalation of vapour or mist. Avoid prolonged or repeated exposure. Handle this product with suitable protection.
- STORAGE** : Store away from sunlight, heat and all ignition sources in well-ventilated dry place. Keep container tightly closed. Keep in freezer (-10°C).
- INCOMPATIBLE PRODUCTS** : Strong oxidizers, acids

8. EXPOSURE CONTROL/PERSONAL PROTECTION

- ENGINEERING MEASURES** : Use exhaust ventilation to keep airborne concentrations below exposure limits.
 Use adequate ventilation.
- VENTILATION** : Local Exhaust ; Necessary, Mechanical(General) ; Necessary
- PERSONAL PROTECTION**
- Respiratory protection** : Use respirators approved under appropriate government standards and follow all regulations.
- HAND PROTECTION** : Chemical resistant gloves
- EYE PROTECTION** : Safety glasses(goggles)
- SKIN PROTECTION** : Protective clothing
- CONTROL PARAMETERS**

CHEMICAL NAME	ACGIH	OSHA Final Limits	NIOSH REL
Ethanol	TWA= 1000 ppm	TWA= 1000 ppm	TWA= 1000 ppm
Ethylene Oxide	TWA 1 ppm	TWA 1 ppm	Ca TWA <0.1 ppm

9. PHYSICAL AND CHEMICAL PROPERTIES

- APPEARANCE** : Liquid
- PHYSICAL STATE** : Colorless, Clear
- ODOR** : Characteristic odor
- pH** : No data available
- BOILING POINT** : approx.78 °C(Ethanol)
- MELTING POINT** : -117 °C(Ethanol)
- FLASH POINT** : 12.8 °C (TCC)(Ethanol)
- EXPLOSIVE LIMITS** : 3.3% (lower), 19 % (upper)(Ethanol)
- VAPOR PRESSURE** : 5.33 kPa (at 20°C)(Ethanol)
- VAPOR DENSITY** : 1.6(Ethanol)
- SPECIFIC GRAVITY** : 0.81 g/cm³ (at 20°C)(Ethanol)
- SOLUBILITY IN(Ethanol)**
- Water : Miscible
- Organic solvent : Miscible
- PARTITION COEFFICIENT; n-octanol/water**
- log Pow : -0.32(Ethanol)
- AUTOIGNITION TEMPERATURE** : 371 - 427 °C(Ethanol)
- DECOMPOSITION TEMPERATURE** : No data available(Ethanol)

10. STABILITY AND REACTIVITY

- REACTIVITY** : Stable under recommended storage conditions.
- CHEMICAL STABILITY** : Reacts with strong oxidizers.
- CONDITION TO AVOID** : Sunlight, heat, open flames, high temperature, sparks, static electrical charge, other ignition sources, moisture
- INCOMPATIBLE MATERIALS** : Oxidizers and strong acids
- HAZARDOUS DECOMPOSITION PRODUCTS** : CO, CO₂ may be formed.

11. TOXICOLOGICAL INFORMATION

- ACUTE TOXICITY (Oral) : This product is not classified by the calculation result; 720,000 mg/kg.
- ACUTE TOXICITY (dermal) : This product is not classified due to the all known components are in same category.
- ACUTE TOXICITY (inhalation) : This product is not classified due to the all known components are in same category.
- SKIN CORROSION/IRRITATION : Ethylene oxide is in Category 2, but its concentration was less than 0.1% and thus this product is not classified.
- EYE DAMAGE/EYE IRRITATION : Ethylene oxide is in category 2A and ethanol is in category 2B, and the combined concentrations applying the additive regime were more than 10%, thus this product is classified in Category 2A.
- (Ethanol) : It has been assessed as moderately irritating in two Draize trials (OECD TG 405) in rabbits (SIDS, 2005).
In one study, corneal opacity, iritis, conjunctival redness, and chemosis were observed, mean scores on day 1 were 1 or more for corneal opacity, conjunctival redness were 2 or more for conjunctival redness, and most findings recovered within 7 days (ECETOC TR 48(2)(1998)).
- (Ethylene Oxide) : Repeated applications of saline in rabbit eyes, in which 0.1-20% or more of the substance has been dissolved, for 6 hours have reported concentration-dependent enhancement of congestion, swelling, iritis, and corneal opacity as irritants of the corneal epithelium and mucosa (ACGIH (2001)), and severe burns to the eyes or immediate irritation of the eyes with large volumes of water immediately entering the eyes but persisting in the conjunctiva only once a day (ECETOC 5 (1984)). In addition, the EU-classification is Xi:R36/37/38(EC-JRC(ESIS)(Access on Sep.2011)).
- SKIN SENSITIZATION : Ethylene oxide is in Category 1, but the classification is not possible in this product.
- (Ethylene Oxide) : This substance is listed in Contact Dermatitis (4th, 2006) as a tactile allergen (Contact Dermatitis (4th, 2006), equivalent to List1) and is classified as a sensitizing substance in the Society of Obstetricians as a "second group of skin" (Obstetric Society Recommendations (2010)).
- GERM CELL MUTAGENICITY : Ethylene oxide is in Category 1B, but the classification is not possible in this product.
- (Ethylene Oxide) : Dominant lethality test (germ-cell in vivo transgenerational mutagenicity test) by inhalational exposure in mice with positive results. In addition, positive results have also been reported in the chromosomal aberration test and micronucleus test (somatic in vivo mutagenicity test) in bone marrow cells of rats, and in humans, positive results have been reported in the chromosomal aberration test, micronucleus test, or sister chromatid-exchange test in peripheral blood lymphocytes of workers handling the chemical. In the in vitro study, positive results (NITE Early Risk Assessment Form (2005)) have been reported in the Ames test (NITE Early Risk Assessment Form 36 (2005)), the micronucleus test using Chinese hamster V9 cells, and the chromosomal aberration test using human pulmonary fibroblasts (IARC 60 (1994)).
- CARCINOGENICITY : This product is classified in Category 1A by Ethanol.
- (Ethanol) : Ethanol has been classified as A3 in ACGIH (ACGIH (7th, 2012)). In addition, IARC (2010) found that ethanol and acetaldehyde, the main metabolite, induce malignancies in the esophagus, etc. by ingestion of ethanol in alcoholic beverages, because there are ample evidences from many epidemiological data on the carcinogenicity of alcoholic beverages.
- REPRODUCTIVE TOXICITY : This product is classified in Category 1A by Ethanol.
- (Ethanol) : In humans, prenatal ethanol ingestion is known to cause congenital anomalies in the newborn called fetal alcohol syndrome. Malformations include microcephaly, short palpebral fissures, joint, limb and heart abnormalities, behavioral and cognitive dysfunction during development (PATTY (6th, 2012)). These are considered to be convincing evidence for the reproductive toxicity of ethanol to humans. In addition, fetal alcohol syndrome is associated with alcoholic women who drank alcohol in large quantities and chronically during pregnancy. There have been no reports of fetal alcohol syndrome due to industrial oral, dermal, or inhalation exposure. Animal studies have also shown the occurrence of malformations in pregnant rats after oral administration.

SPECIFIC TARGET ORGAN TOXICITY - single exposure -

- (Ethanol) : This product is classified in Category 3 due to total concentration of both components is 20% or more.
- (Ethanol) : Human inhalational exposure has been reported to irritate the eyes and respiratory tract (PATTY (6th, 2012)). Increased blood ethanol levels are associated with mild intoxication (e.g., decreased muscular coordination, mood, personality, and behavioral changes) leading to moderate intoxication (visual impairment, sensory paralysis, delayed response times, speech disturbances), and more severe symptoms of intoxication (e.g., emesis, lethargy, hypothermia, hypoglycemia, respiratory depression). In addition, respiratory or circulatory failure or the absence of pharyngeal reflexes have been described to result in death as a result of aspiration of gastric contents (PATTY (6th, 2012)). In addition to humans, laboratory animals have also experienced central nervous system depression (SIDS (2005)).
- (Ethylene Oxide) : In most people exposed to inhalation, acute effects on the nervous system include nausea, vomiting, headache, and, less frequently, decreased consciousness (coma), agitation, insomnia, weakness, diarrhea, and abdominal discomfort. In addition, dyspnea, lacrimation, uncoordinated, and semi-conscious states have been observed at concentrations equivalent to guidance-value category 1 above LD50 (660 ppm) in studies in which mice were exposed by inhalation. Severe airway damage due to tracheal and laryngeal inflammatory reactions has also been reported in patients at 17 hospitals who underwent endotracheal intubation with tubes sterilized with the agent (EHC 55 (1985)).

SPECIFIC TARGET ORGAN TOXICITY - Repeated exposure -

- (Ethanol) : This product is classified in Category 1 and 2 by Ethanol.
- (Ethanol) : Long-term heavy consumption of alcohols in humans adversely affects almost all organs, but the target organ with the strongest impact is the liver, and the disorder has been described as starting with steatosis and progressing through the stages of necrosis and fibrosis to cirrhosis (DFGOT vol. 12 (1999)). There is also a statement that the U.S. Food and Drug Administration has approved three therapeutic drugs for the treatment of patients with alcohol abuse and dependency (HSDB(Access on June 2013). In animal studies, adverse effects were less pronounced, and fatty degeneration was reported as an effect on the liver at doses well above the guidance-value ranges in a 90-day repeated oral dose study in rats (SIDS (2005), PATTY (6th, 2012)).

ASPIRATION HAZARD

- : The classification is not possible in this product.

12. ECOLOGICAL INFORMATION

Hazardous to the aquatic environment -Acute hazard -

- (Fish) : The classification is not possible in this product.
- (Fish) : (Ethylene Oxide) Pimephales promelas LC50 = 84 mg/L (EHC 55,1985)
- (Fish) : (Ethanol) Rainbow trout LC50 = 11,200 ppm, 96h (SIDS,2005)

Hazardous to the aquatic environment -Chronic hazard -

BIODEGRADABILITY

- : Both components are rapidly degradable (BOD=108% ethylene oxide, 89% ethanol) (Existing Inspection, 1993), and ethanol is not poorly water soluble (ICSC, 2000).

BIOACCUMULATIVE POTENTIAL

- : Ethylene oxide is less bio accumulative (BCF < 0.36-0.88 (2 mg/L)).

MOBILITY IN SOIL

- : No data available

Hazardous to the ozone layer

- : This substance is not listed in Annexes to the Montreal Protocol.

13. DISPOSAL INFORMATION

Dispose in a hazardous-waste site in accordance with all applicable regulations. Any disposal practice must be in compliance with country, local, state, and federal laws and regulations (contact country, local or state environment agency for specific rules).

14. TRANSPORT INFORMATION

IATA

UN NUMBER : 1170
UN PROPER SHIPPING NAME : Ethanol solution
CLASS : 3, flammable liquid
PACKING GROUP : II
ADR/RID : 1170, ETHANOL SOLUTION
DOT : 1170, ETHANOL SOLUTION
MARINE POLLUTANT : Not classified

15. REGULATORY INFORMATION

For classification and labeling of chemicals in accordance with the applicable rules and regulations in the EU or each country, refer to GHS classification of this product (See Section 2).

US REGULATION : OSHA HCS 2012/29 CFR 1910.1200
EU REGULATION : CLP Regulation ((EC) No. 1272/2008)

16. OTHER INFORMATION**NOTICE:**

The information contained in the SDS description is applicable exclusively to the chemical substance identified herein and for its intended use as an analytical reference standard or reagent and to the unit quantity intended for that purpose. The information does not relate to, and may not be appropriate for, any application or larger quantity of the substance described. Our products are intended for the use by individuals possessing sufficient technical skill and qualification on use the material potential hazardous chemical. Accordingly, no representation or warranty, express or implied, with respect to merchantability and fitness for a particular purpose is made with respect to the information contained herein.

Attention:

This product in terms of chemical identity and the unit amount provide is intended for use in chemical analysis and not for human consumption, nor any other purpose.