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Safety Data Sheet

1. Chemical product and company identification

Product name	:	EL-GBL

Company information

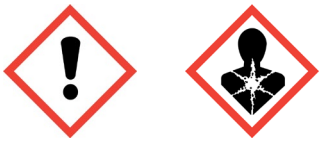
Name of manufacturer	:	KANTO CHEMICAL CO., INC.
Address	:	2-1, Nihonbashi, Muromachi 2-Chome, Chuo-Ku, Tokyo, 103-0022, Japan
Name of section	:	Electronic materials division technical department
Telephone number	:	+81-3-6214-1080
Facsimile number	:	+81-3-3241-1043
Mail address	:	el-info@kanto.co.jp
Reference No	:	GE00432 1.2
Recommended uses and restrictions	:	Electronic chemicals

2. Hazards identification

GHS classification

Health hazards	Acute toxicity (oral)	Category 4
	Serious eye damage/eye irritation	Category 2A
	Specific target organ toxicity (single exposure)	Category 2 (central nervous system)
	Specific target organ toxicity (single exposure)	Category 3 (narcosis)

Hazard pictograms



Signal word : Warning

Hazard statements :
Harmful if swallowed
Causes serious eye irritation
May cause drowsiness or dizziness
May cause damage to organs (central nervous system)

Precautionary statements

Prevention :
Do not breathe mist/vapors.
Wash hands, forearms and face thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.

Response :
IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or concerned: Call a POISON CENTER or doctor.

		Call a POISON CENTER or doctor if you feel unwell. Rinse mouth. If eye irritation persists: Get medical advice/attention.
Storage	:	Store in a well-ventilated place. Keep container tightly closed. Store locked up.
Disposal	:	Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

3. Composition/information on ingredients

Distinction of substance or mixture : Substance

Synonyms : γ-Butyrolactone

Chemical name	Concentration (%)	Formula	TSCA	EC-No.	CAS RN
4-Butyrolactone	min. 99.5	C4H6O2	Listed	202-509-5	96-48-0

4. First aid measures

First aid measures

First-aid measures after inhalation : Remove the victim to fresh air, and make him blow his nose and gargle.

First-aid measures after skin contact : Wash the affected areas under running water.

First-aid measures after eye contact : Wash the affected areas under running water for at least 15 minutes. If necessary, get medical treatment.

First-aid measures after ingestion : Rinse mouth. Do not induce vomiting. Get medical attention immediately.

Self protection of the first-aider : Rescuers should wear proper protective equipment like rubber gloves, goggles.

5. Fire fighting measures

Suitable extinguishing media : Water, dry chemical powder, carbon dioxide, dry sand, alcohol resistant foam

Unsuitable extinguishing media : Foam extinguisher

Firefighting instructions : Move containers from fire area if it can be done without risk, if not possible, apply water from a safe distance to cool and protect surrounding area.

Fight fire from windward.

Dry chemical powder, carbon dioxide or dry sand should be used for small fires. Alcohol-resistant foam extinguisher is effective for a large scale fire.

Personal protection (Emergency response) : Firefighters should wear protective equipment.

6. Accidental release measures

Personal Precautions, Protective Equipment and Emergency Procedures

General measures : Wear proper protective equipment and avoid contact with skin and

inhalation of vapor. Conduct operations from upwind and evacuate people downwind. Remove all sources of ignition. Keep away personnel except for authorized ones from spillage area by stretching ropes.

Environmental precautions

Environmental precautions	:	Attention should be given to avoid discharge of spilled product into rivers and resulting environmental damage. When diluting spill with large amounts of water, discharge of untreated wastewater into the environment must be avoided.

Methods and Equipment for Containment and Cleaning up

For containment	:	Absorb spill with inert material (e.g, diatomaceous earth, sand) and flush spillage area with copious amounts of water.
Prevention Measures for Secondary Accidents	:	Remove nearby sources of ignition and prepare extinguishing media.

7. Handling and storage

Handling

Technical measures	:	Wear proper protective equipment to avoid contact with skin or inhalation of vapor. Pay attention to fire. Ventilate well at working places.
Precautions for safe handling	:	Avoid formation of vapor and aerosols. Do not allow contact with oxidizing substances.

Storage

Storage conditions	:	Store in a dark, cool place and tightly closed.
Material used in packaging/containers	:	Glass, stainless steel.

8. Exposure controls / Personal protection equipment

Appropriate engineering controls	:	Use with an enclosed system or a local exhaust ventilation.

Protective equipment

Respiratory protection	:	Chemical cartridge respirator with an organic vapor cartage or airline respirator
Hand protection	:	Impervious protective gloves
Eye protection	:	Safety goggles
Skin and body protection	:	Protective clothing, protective boots

9. Physical and chemical properties

Physical state	:	Liquid
Color	:	Colorless - pale yellow
Odor	:	acetone-like
pH	:	No data available
Melting point	:	-44 ° C
Freezing point	:	No data available
Boiling point	:	204 ° C

Flash point	:	98 ° C (C.C.)
Auto-ignition temperature	:	455 ° C
Decomposition temperature	:	No data available
Flammability	:	Flammable
Vapor pressure	:	1.5 hPa (20℃)
Relative density	:	No data available
Density	:	1.13 g/cm³ (25℃)
Relative gas density	:	3
Solubility	:	Water: Miscible Organic solvent: Soluble in ethanol, diethyl ether, acetone, benzene.
Partition coefficient n-octanol/water (log Pow)	:	-0.64
Explosive limits (Vol-%)	:	1.4 - 16.0 Vol-%
Viscosity, kinematic:	:	1.77 mm²/s
Particle characteristics	:	No data available

10. Stability and reactivity

Reactivity	:	May react with oxidizing substances. Hydrolyzed by hot alkaline solution.
Chemical stability	:	Stable under normal conditions. Hydroscopic.
Possibility of hazardous reactions	:	Stable under normal conditions of use.
Conditions to avoid	:	Light, heat, moisture.
Incompatible materials	:	Oxidizing substances.
Hazardous decomposition products	:	Carbon monoxide.

11. Toxicological information

Acute toxicity (oral)	:	Harmful if swallowed rat LD50=800-1600 mg/kg
Acute toxicity (dermal)	:	No classification rat LD50≈5600 mg/kg
Acute toxicity (inhalation)	:	No classification (gas) No classification (vapor) No classification (dust, mist)
Acute toxicity (dust, mist) - Description	:	rat LC50>5.1 mg/L/4h
Skin corrosion/irritation	:	No classification In the rabbit test, application of undiluted substance for 20 hours caused no irritating effects. In other rabbit test, slightly, hardly perceptible or moderate erythema and hardly perceptible edema occurred and resulted as "mildly irritating". Based on the information, the substance was classified as "No classification". As relevant notes, application of undiluted technical-grade of the test substance to rabbits caused moderate to severe erythema with edema in 3 of 4 animals, and one animal revealed apparent erythema without edema formation after 72 hours of application. Therefore, test substance was concluded as moderate to severe irritating to the skin.

Serious eye damage/irritation	:	Causes serious eye irritation The substance was classified as category 2A based on the report in which in a study using rabbits (OECD TG 405, GLP), the modified maximum average score (MMAS) was 43.9 (maximum score was 110) equivalent to AOI 30 - 80. In other rabbit tests, some results were reported as follows: irritation effects containing inflammatory irritation and slight corneal opacity, corrosive effects containing severe irritation with conjunctive necrosis, radial damage, corneal opacity and ulceration and irritation of the conjunctiva, iris and cornea and recovery within 7 days after treatment in 5 of 6 animals.
Respiratory sensitization	:	Classification not possible
Skin sensitization	:	Classification not possible In the guinea pig test, skin sensitization was not evident, however, details of test methods and results were not reported. Therefore, classification is not possible due to lack of data.
Germ cell mutagenicity	:	No classification it was classified as "No classification" due to negative results in both of two micronucleus test data using bone marrow cells obtained from the mice intraperitoneally administered (in vivo mutagenicity test in somatic cells). As relevant information, as for in vitro studies, negative results in the Ames test and positive results in the chromosome aberration test using Chinese hamster ovary cells were reported.
Carcinogenicity	:	Classification not possible The classification was concluded as "classification not possible" based on the criterion of "Group 3" by the IARC carcinogenicity assessment. As relevant information, in the 2-year oral administration study in rats and mice, as for rats, no evidence of carcinogenicity of the substance was noted because no increase in the incidence of neoplastic lesions associated with the administration in both sexes was observed. As for mice, ambiguous evidence of carcinogenicity was shown because the incidences of hyperplasia and pheochromocytoma of the adrenal medulla slightly increased in males at low dose, but no evidence of carcinogenicity in females.
Reproductive toxicity	:	Classification not possible In the oral administration study using pregnant rats during the organogenetic period, no embryotoxicity were seen. In the inhalation study using pregnant rabbits during the organogenetic period (OECD TG 414, GLP-compliant), no signs of maternal toxicity and embryotoxicity were observed, and there was no evidence of treatment-related teratogenicity. However, because no information was provided regarding sexual functions and fertility of parental animals, the substance was classified as "classification not possible".

STOT-single exposure	:	May cause damage to organs (central nervous system) May cause drowsiness or dizziness As for acute toxic effects based on human cases, the following symptoms were described: bradycardia, hypothermia, depression of central nervous system, prolonged unconsciousness, confusion, aggression, torpor, and ataxia. In fact, unconsciousness was reported in numerous cases who ingested the substance or its products, and the signs concurrently observed included coma, narcosis, convulsions and hypopnea. In the animal study, it was reported that signs of sedation and loss of righting reflex were described in rats (LD50 value: 1800 mg/kg) following single oral administration, the findings corresponded to category 2 within the range of the guidance values. With regard to the results described above, the substance was classified as category 2 (central nervous system). Moreover, narcotic effects were also described, so that category 3 (narcotic effects) was added.
STOT-repeated exposure	:	Classification not possible In the 13-week repeated oral dose studies in rats and mice, deaths occurred at the highest dose level in both species (900 mg/kg/day for rats, 1050 mg/kg/day for mice), suppression of body weight gain and lateral position were found in rats at 450 mg/kg/day or higher, and in mice at 525 mg/kg/day or higher. No toxic effects were seen in rats at 225 mg/kg/day and in mice at 262 mg/kg/day, except for slight to moderate inactivity. In addition, the NOEL values in the 90-day feeding studies in both rats and dogs were reported as 0.8% (400 mg/kg/day) that exceeded the range of the guidance values. According to these documents, the classification is considered as equivalent to "Not classified" category in oral route. However, since no sufficient data was available for the other routes (inhalation, dermal), the classification for specific target organ toxicity (repeated exposure) was concluded as "classification not possible".
Aspiration hazard	:	Classification not possible

12. Ecological information

Ecotoxicity

Aquatic acute	:	No classification Crustacea EC50>100 mg/L/48h
Aquatic chronic	:	No classification

Persistence and degradability

Readily biodegradable
BOD : 77%

Bioaccumulative potential

Low bioconcentration
log Pow : -0.64

Mobility in soil

No additional information available

Hazardous to the ozone layer

Hazardous to the ozone layer : Classification not possible

13. Disposal considerations

Ecological waste information	:	Burn in a chemical incinerator equipped with an afterburner and a scrubber. Or entrust approved waste disposal companies with the disposal.
Contaminated container and packaging	:	In case of disposal of empty bottles, dispose bottles after removing the content thoroughly.

14. Transport information

International Regulations

Transport by sea(IMDG)

UN-No. (IMDG)	:	Not applicable
Proper Shipping Name (IMDG)	:	Not applicable
Packing group (IMDG)	:	Not applicable
Transport hazard class(es) (IMDG)	:	Not applicable

Air transport(IATA)

UN-No. (IATA)	:	Not applicable
Proper Shipping Name (IATA)	:	Not applicable
Packing group (IATA)	:	Not applicable
Transport hazard class(es) (IATA)	:	Not applicable
Marine pollutant	:	Not applicable

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

Pollutant category	:	Y

15. Regulatory information

Regulatory information with regard to this substance in your country or region should be examined by your own responsibility.

16. Other information

Data sources	:	NITE Chemical Risk Information Platform (NITE-CHRIP), National Institute of Technology and Evaluation. ICSC Card (2009) . ECHA (European Chemicals Agency).

The information contained herein is based on several references and the present state of our knowledge. However the SDS does not always cover all information about the product, handle the product carefully.The information is intended to ordinary usage, in case of particular handlings, conduct appropriate safety measurements.The information herein is only provision of information, and it does not represent a guarantee the properties of the product.