Safety Data Sheet

1. Chemical product and company identification

Product name : Ethanol

Company information

Name of manufacturer : KANTO CHEMICAL CO., INC.

Address : 2-1, Nihonbashi, Muromachi 2-Chome, Chuo-Ku, Tokyo, 103-0022, JP

Name of section : Business Administration Department, Reagent Division

 Telephone number
 : +81-3-6214-1090

 Facsimile number
 : +81-3-3241-1047

 Mail address
 : BC32@kanto.co.jp

Reference No : 14650-08

Product numbers applied by the

SDS

: 14650-08, 14650-84

Recommended uses and : The Japanese Standards of Quasi-Drug Ingredients

restrictions

2. Hazards identification

GHS classification

Physical hazards Flammable liquids Category 2
Health hazards Serious eye damage/eye Category 2B

irritation

Carcinogenicity Category 1A
Reproductive toxicity Category 1A

Specific target organ toxicity Category 3 (narcosis)

(single exposure)

Specific target organ toxicity Category 3 (respiratory tract irritation.)

(single exposure)

Specific target organ toxicity Category 1 (liver)

(repeated exposure)

(repeated exposure)

Hazard pictograms







Signal word : Danger

Hazard statements : Highly flammable liquid and vapor

Causes eye irritation

May cause respiratory irritation May cause drowsiness or dizziness

May cause cancer

May damage fertility or the unborn child

Causes damage to organs (liver) through prolonged or repeated

exposure

May cause damage to organs (central nervous system) through

prolonged or repeated exposure

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Precautionary statements

Prevention : Do not handle until all safety precautions have been read and

Keep away from heat, hot surfaces, sparks, open flames and other

ignition sources. No smoking. Keep container tightly closed.

Ground and bond container and receiving equipment.

Use explosion-proof electrical/ventilating/lighting equipment.

Use only non-sparking tools. Do not breathe mist / vapor.

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 ON SKIN (or hair): Take off immediately all contaminated

clothing. Rinse skin with water.

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

IF exposed or concerned: Get medical advice/attention. Call a POISON CENTER or doctor if you feel unwell. Get medical advice/attention if you feel unwell.

If eye irritation persists: Get medical advice/attention.

Storage : Store in a well-ventilated place. Keep container tightly closed.

Store in a well-ventilated place. Keep cool.

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 : Substance

mixture

Synonyms : Ethyl alcohol

Chemical name	Concentration (%)	Formula	TSCA	EC-No.	CAS RN
Ethanol	94. 83 - 95. 85	С2Н5ОН	Listed	200-578-6	64-17-5

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

: The chemical is volatile. Do not induce vomiting because it increases the risk of aspiration into the lungs. Get medical

ingestion

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attention immediately. If necessary, rinse mouth with water.

Personal Protection in First Aid and Measures

Rescuers should wear proper protective equipment like rubber gloves, goggles.

Most Important Symptoms/Effects

Symptoms/effects Inhalation causes cough, headache, feeling of fatigue, and

lethargy.

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)

Wear breathing apparatus.

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. Fire is strictly prohibited.

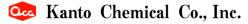
Ventilate well at working places.

Prevent build-up of electrostatic charges (e.g. by grounding).

Precautions for safe handling : Use with an enclosed system or a local exhaust ventilation. Use

in well-ventilated areas.

Do not allow contact with oxidizing substances.



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Storage

Storage conditions : Store in a dark, cool place and tightly closed.

Material used in : Glass, fluorine resin, stainless steel.

packaging/containers Do not use polyvinyl chloride resin, acrylic resin.

8. Exposure controls / Personal protection equipment

ACGIH STEL 1000 ppm

Appropriate engineering

controls

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

Protective equipment

Respiratory protection : If necessary, wear gas mask for organic solvents 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.
Odor : Aromatic
pH : Neutral
Melting point : -114.1 ° C

Freezing point : No data available

Boiling point : $78.5 \,^{\circ}$ C Flash point : $14 \,^{\circ}$ C (C.C.) Auto-ignition temperature : $363 \,^{\circ}$ C

Decomposition temperature : No data available

Flammability : Flammable Vapor pressure : 59 hPa (20°C)

Relative density : $0.81444 - 0.81639 (15/15^{\circ}C)$ Density : $0.808 - 0.812 \text{ g/cm}^{3} (20^{\circ}C)$

Relative gas density : 1.59

Solubility : Water: Miscible. Organic solvents: Miscible with many kinds of

organic solvents like diethyl ether, chloroform.

Partition coefficient n- : -0.32

octanol/water (log Pow)

Explosive limits (vol %) : 4.3 - 19 vol %Viscosity, kinematic : $1.48 \text{ mm}^2/\text{s}$ (20°C) Particle characteristics : No data available

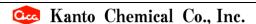
10. Stability and reactivity

Reactivity : May react with strong oxidizing substances.
Chemical stability : Stable under normal conditions of use.

Possibility of hazardous

reactions

: No dangerous reactions known under normal conditions of use.



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Conditions to avoid : Light, heat.

Incompatible materials : Oxidizing substances. Hazardous decomposition : Carbon monoxide.

products

11. Toxicological information

Acute toxicity (inhalation)

Acute toxicity (oral) : No classification

> rat LD50=6200mg/kg : No classification

Acute toxicity (dermal) rat LDL0=20000mg/kg

> : No classification (gas) No classification (vapor)

rat LC50=63000ppm/4h Classification not possible (dust, mist)

Skin corrosion/irritation No classification

> In a 4-hour exposure test in rabbits (OECD TG 404), mean score for erythema was 1.0 after 1 and 24 hours of exposure. Mean scores for erythema and edema were 0.0 at all other time, indicating "no irritation". Thus, it was classified as "No classification".

Causes eye irritation Serious eye damage/irritation

> In two Draize tests in rabbits (OECD TG 405), moderate irritation was observed. In one test, signs of corneal opacity, iritis, conjunctival redness, and chemosis were observed. Mean scores on Day 1 were 1 or more for corneal opacity, 2 or more for

conjunctival redness, and most effects were reversible within 7

days. Thus, it was classified into category 2B.

Respiratory sensitization Classification not possible Skin sensitization Classification not possible

Germ cell mutagenicity No classification

> As for in vivo tests, there are negative data on micronucleus assay in rat and mouse bone marrow, negative data on chromosome aberration tests in rat bone marrow and peripheral blood lymphocytes, and negative data on chromosome aberration tests in Chinese hamster bone marrow. In addition, negative results are obtained for micronucleus assay in mouse spermatids, chromosome aberration tests in spermatocytes, chromosome aberration tests in rat spermatogonia, and chromosome aberration tests in Chinese hamster spermatogonia. As for in vitro mutagenicity tests, there are negative data on the Ames test, and mouse lymphoma assay and

micronucleus assay in cultured mammalian cells.

Carcinogenicity May cause cancer

> IARC shows that there is ample evidence for carcinogenicity of alcoholic beverages from many epidemiological data, indicating that ethanol and its main metabolite, acetaldehyde, induce malignant tumors in esophagus following ingestion of ethanol-containingalcoholic beverages. Thus, ethanol was classified into category 1A.

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Reproductive toxicity

STOT-single exposure

STOT-repeated exposure

Human studies have shown that prenatal ingestion of ethanol causes congenital malformation known as fetal alcohol syndrome in neonates. The malformation includes microcephaly, short palpebral fissures, abnormalities of joint, limbs and heart, and behavioral and cognitive impairment during development. As the above data are considered clear evidence of reproductive toxicity of ethanol in humans, it was classified into category 1A. As relevant

information, fetal alcohol syndrome is related to female alcoholics who drink alcohol regularly in large quantities during the gestation period. There are no reports of fetal alcohol syndrome caused by industrial oral, dermal, or inhalation exposure. Animal studies have shown that malformations were observed in oral

administration studies in pregnant rats.

: May damage fertility or the unborn child

May cause drowsiness or dizziness May cause respiratory irritation

Human studies have shown that inhalation exposure causes irritative symptoms of eyes and respiratory tract. An increase in blood ethanol concentration results in mild poisoning (decreased muscular coordination, changes in feeling, character, behavior), moderate poisoning (visual impairment, sensory paralysis, delayed reaction time, speech disorder), and severe toxic symptoms (vomiting, lethargy, hypothermia, hypoglycemia, and respiratory depression). In addition, due to respiratory or circulatory failure, or in case of absent gag reflex, aspiration of gastric contents may lead to death. Thus, it was classified into category 3 (respiratory tract

irritation, narcosis).

Causes damage to organs (liver) through prolonged or repeated exposure

May cause damage to organs (central nervous system) through prolonged or repeated exposure

Long-term consumption of large doses of alcohol causes toxic effects in almost all organ systems. The most affected target organ is the liver; beginning with fatty degeneration, damage can progress via necrosis and fibrotic stages to liver cirrhosis. Based on this information, it was classified into category 1 (liver). There is a report that patients with severe physical dependence caused by alcohol consumption experience craving and drug-seeking behavior and hyperreflexia with nausea, weakness, anxiety and sweating, in addition to the elicitation of a withdrawal syndrome of tremors, seizures and delirium. Based on this information, it was classified into category 2 (central nervous system).

Aspiration hazard Classification not possible

12. Ecological information

Ecotoxicity

Aquatic acute : No classification

Daphnia magana EC50=5463mg/L/48h

Aquatic chronic : No classification

Ceriodaphnia dubia NOEC=9.6mg/L/48h

Persistence and degradability

Readily biodegradable

BOD: 89%

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Bioaccumulative potential

Low bioconcentration log Pow : -0.32

Mobility in soil

High mobility Koc : 0.20

Hazardous to the ozone layer

Ozone : 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 $% \left(1\right) =\left(1\right) \left(1\right$

removing the content thoroughly.

14. Transport information

International Regulations

Transport by sea(IMDG)

UN-No. (IMDG) : 1170

Proper Shipping Name (IMDG) : ETHANOL (ETHYL ALCOHOL)

Packing group (IMDG) : II
Transport hazard class(es) : 3

(IMDG)

Air transport(IATA)

UN-No. (IATA) : 1170
Proper Shipping Name (IATA) : Ethanol
Packing group (IATA) : II
Transport hazard class(es) : 3

(IATA)

Marine pollutant : Not applicable

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

Pollutant category : Z MFAG-No : 127

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 : Solvents Handbook, T, Asahara el, Kodansha Scientific Ltd.

(1976) .

Handbook of dangeroous and hazardous chemicals, Japan Industrial Safety & Health Association. (2000-2001) . Dangerous Properties of Industrial Materials, 6th ed.

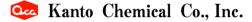
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NITE Chemical Risk Information Platform (NITE-CHRIP), National Institute of Technology and Evaluation.

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. The Safety Data Sheet(SDS) is prepared based on JIS Z7253.