Material Safety Data Sheet

1. Chemical Product and Company Identification
   Chemical product name: Alcohol
   Traceable 99 1st Grade
   Traceable 99 Kosher
   Supplier name: JAPAN ALCOHOL CORPORATION
   Address: 1-10-2, Nishishimbashi, Minato-ku, Tokyo, Japan
   Department: Quality Control and Environmental Safety Office.
   Tel: 81-3-5511-8841     Fax: 81-3-5510-0792
   Contact:  http://www.j-alco.com/inquiry/index.html

2. Summary of Harm and Hazards
   GHS Classifications
   Physical and chemical hazardousness:
   - Flammable liquid: Class 2
   - Pyrophoric liquid: Not classified
   - Self-heating substance: Not classified
   - Corrosive to metal: Not classified

   Harmfulness for human health:
   - Acute toxicity (oral): Not classified
   - Acute toxicity (dermal): Cannot Be Classified
   - Acute toxicity (vapor): Not classified
   - Acute toxicity (inhalation: mist): Not classified
   - Dermal corrosion/irritation: Not classified
   - Serious eye damage/irritation: Class 2A-2B
   - Respiratory sensitization: Cannot Be Classified
   - Skin sensitization: Cannot Be Classified
   - Germ cell mutagenicity: Class 1B
   - Carcinogenicity: Not classified
   - Reproductive toxicity: Class 1A
   - Specific target organ systemic toxicity - single exposure
     - Class 3 (respiratory tract irritability, narcotic)
   - Specific target organ systemic toxicity - repeated exposure
     - Class 1 (liver), Class 2 (nerve)
   - Inhalation respiratory hazard: Cannot Be Classified

   Environmental effects:
   - Acutely hazardous to the aquatic environment: Not classified
   - Chronically hazardous to the aquatic environment: Not classified

   Other harm and/or hazards are not classified.
Pictograms:

Signal Word: Danger

Hazard Statement: Highly flammable liquid and vapor
Strong eye irritability
Possible risk of genetic disease
Possible risk of adverse effect on fertility or fetuses
Possible respiratory irritation
Possible drowsiness or vertigo
Organ (liver) injury after a long-term or repeated exposure
Possible organ (nerve) injury after a long-term or repeated exposure

Precautionary statement:
Do not deal with this substance until you have thoroughly read and understood all the following safety notices.
Do not eat, drink, or smoke while you use this product (No smoking).
Keep this product away from ignition sources such as heat, spark, naked flame, and something with high temperature.
Use explosion-proof electronic products, ventilators, and illuminators.
Prevent ignition from static discharge and/or spark.
Use protective equipment and ventilators to avoid exposure.
Wear protective gloves, goggles, and facemask.
Use this product only outdoors or in a well-ventilated area.

3. Composition/Information on Ingredients
Chemical or Mixture: A single product
Chemical name: Ethanol
Synonyms: Ethyl alcohol, Methylcarbinol, Ethyl hydroxide, Ethyl hydrate, Spirits of wine
Content: not less than 99.8 % alcohol by volume
Chemical formula: C2H5OH
Molecular mass: 46.07
CAS: ethanol No.64-17-5
Official gazette reference No. (under the Law concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances, and the Law concerning Industrial Safety and Health): (2)-202
Hazardous and harmful ingredients: Not contained
4. First Aid Measures

Inhalation:
Immediately remove affected person into fresh air and keep at rest. Seek immediate medical treatments if affected severely.

Skin contact:
Immediately remove contaminated clothes and wash the affected region with running water. Clean off fully with soap.

Eye contact:
After washing with large amount of water for at least 15 minutes, seek immediate medical treatments by an ophthalmologist.
Take applied contact lenses off if they can be so easily, then consult an ophthalmologist.

Ingestion:
After rinse the mouth with water again and again, give several cups of water to drink for diluting the effect and induce vomiting with fingers inserted into the throat if possible. Seek immediate medical treatments. If unconscious, give nothing orally. Don’t try to make him/her vomit. Consult a doctor immediately.

5. Fire Fighting Measures

Extinguishing media:
Water, dry chemical, alcohol-resistant foam and carbon dioxide.

The digestive which you must not use:
Stick flooding

Fire fighting ways:
In the initial stage of fire, extinguish the fire with large amount of water injection, or with fire extinguishers using dry chemical, carbon dioxide, etc. In case of big fire, interrupt from the air by foam (alcohol-resistant foam).

Protection for fire fighters:
Wear an appropriate respirator and chemical protective clothing during fire fighting.

6. Accidental Release Measures

Personal Precautions, Protective Equipment, and Emergency Measures:
Let only authorized people enter.
For avoiding physical contact with high concentration of material, put on appropriate protection such as protective glasses, gas mask and hose mask.

Environmental Precautions:
Prevent this product from being released into the river that may affect on the environment.
When this product is diluted with a large amount of water, prevent contaminated wastes from being released into the environment without appropriate treatment.

Measures and Equipment for Containment and Cleaning:
In case of small amount, wash away the leaky area immediately with plenty of water.
In case of large amount, collect leaking and spilling liquid in empty sealable containers as much as possible. Wash away remainder with plenty of water.

Preventive Measures against Secondary Disaster:
Immediately remove adjacent ignition sources because this has permeability and volatility.
7. Handling and Storage

Handling

Technical Measures:
Take engineering measures and wear protective equipment specified under “8. Exposure Controls/Personal Protection.”

Local and General Ventilation:
Take engineering measures specified under “8. Exposure Controls/Personal Protection” for good ventilation.

Precautions:
- Avoid contact with or pouring into flammable or other possible fire sources. Do not vaporize or heat up it.
- Don’t lay, drop, impact, or drag containers.
- Make the whole electrical equipment in facilities for handling and storing with explosion-proof constructions. In places where possibly causes static electricity by alcohol flowage or others, set up equipment for effectively removing it.
- Always keep facilities for handling in order and do not lay flammable or oxidative materials in or near the facilities.

Safe Handling Advice: See “10. Stability and Reactivity.”

Storage

Storage Conditions:
Store in a storage facility under the Fire Service Law. Keep the place well ventilated to prevent the vapor from retention. Also the materials less than designated volume should be kept away from ignition sources and other dangerous areas, stored in cool and dark places well ventilated, at appropriate temperature and humidity, and shielded from light.

Do not store the material mixed with hazardous materials designated as Category 1 and Category 6 under the Fire Service Law. In principle, do not store it mixed with nonhazardous materials but in case of storing with flammable solids or flammable liquid other than hazardous materials, by way of exception, store each of them in a mass and place the masses at intervals of one meter or more each other.

Container and Packaging Materials:
Use containers specified under the Fire Service Law and UN legislation covering transportation.


8. Exposure Controls, Personal Protection

Facility measures:
- It is important to use a closed system. Use explosion-proof lighting. Handling should be made in places with no ignition sources and well ventilated.

Occupational exposure limits: ACGIH (1996): TWA 1000 ppm (1880 mg/m3)

Protective equipment:
- Put on rubber gloves, rubber apron and protective footwear in ordinary circumstances. In places with high concentration of material, put on rubber gloves, rubber apron, protective footwear, protective glasses and gas mask.

Working clothes: Put on antistatic clothes.
9. Physical and Chemical Properties (as alcohol 100%)
   Physical state: Liquid, Color: Transparent and colorless, Odor: Characteristic redolence,
   Sapor: Stimulating taste, pH: Not applicable, Boiling point: 78.32°C (101.325 kPa),
   Melting point: -114.5°C, Flash point: 13°C, Ignition temperature: 439°C
   Explosive limits: From lower point of 3.3 vol% to upper point of 19.0 vol% (in the air),
   Vapor pressure: 5.878 kPa (at 20°C), Relative vapor density (air = 1): 1.59,
   Density: 0.78493 g/cm³ (at 25°C), Solubility in solvents: Well dissolves in water and ether.,
   Octanol/water partition coefficient: -0.30 (logPow), Decomposition temperature: No data

10. Stability and Reactivity (as alcohol 100%)
    Stability:
    Stable, not generate hazardous or harmful decomposition product in ordinary handling
    conditions.
    Possible Hazardous Reactions:
    The substance violently reacts with strong oxidants such as nitric acid, silver nitrate, mercury
    nitrate, and magnesium perchlorate, causing fire and explosion hazard.
    The product erodes certain plastics, rubbers, and film forming agents.
    Conditions to Avoid: Exposure to a high temperature
    Incompatible Materials: Strong oxidants, calcium hypochlorite, and ammonia
    Hazardous Decomposition Products: Carbon monoxide

11. Toxicological Information (as alcohol 100%)
    Acute toxicity
    Oral, in humans: LDL0: 1400 mg/kg, affects behaviors and gastrointestinal systems (causes
    nausea).
    Oral, in rats: LD50: 7060 mg/kg, affects respiratory systems.
    Inhalation, in rats: LC50 20000 ppm/10h, toxicity unassessed.
    Oral, in humans (male): TDL0: 700 mg/kg, affects behaviors (psychophysiologically)
    Injection, in rats: LD50: 1440 mg/kg, affects respiratory systems.
    Injection, in dogs: LDL0: 1600 mg/kg, causes ataxia and affects respiratory systems.
    Intra-abdominal, in mammals: LD50: 4300 mg/kg, causes ataxia
    Mutagenicity
    Micronucleus, in mice (abdominal cavity): 1240 mg/kg/48 hours.
    Dermal corrosion/irritation
    Skin, in rabbits: 400 mg, open, causes mild irritation.
    Skin, in rabbits: 500 mg/24 hours, causes severe irritation.
    Carcinogenicity
    IARC classifies the product as Group 1 due to it is “carcinogenic as an alcoholic drink in
    human.” This is because IARC considers the causal relationship between alcoholic drink and
    esophageal system and liver carcinomas based on various epidemiological surveys on people
    habitually taking alcoholic drink. On the other hand, ACGIH classifies ethanol as A4 (substance
    that cannot be classified as human carcinogen) as a hazardous factor mainly in a working
    environment.
    Oral, in mice: TDL0: 320 mg/kg/50 weeks, toxicity unassessed.
Serious eye damage/irritation

This product is classified as “moderate” based on a study according to OECD TG405 and Draize test.
Human corneal epithelium injury and conjunctival injection will be reversed in 1 or 2 days.
Eyes, in rabbits: 100 mg/24 hours, causes moderate irritation.

Respiratory sensitization
No information

Skin sensitization
No significant skin sensitization has been observed in animal studies.

Germ cell mutagenicity
Dominant lethal in rats and mice and heteroploidy in mouse germ cells have been reported.

Reproductive toxicity
There have been many reports that habitual intake of a large amount of alcohol may cause malformation and other adverse effects in human fetuses.
Inhalation, in rats: TCL0: 20000 ppm/7 hours, causes poor development on day 1 to 22 of gestation.
Oral, in rats: TDL0: 44 g/kg, causes poor development on day 7 to 17 of gestation.

Specific target organ systemic toxicity - single exposure
In human, oral intake of ethanol may cause adverse effect on the central nervous system and headache, fatigue, less concentration, and, in case of acute intoxication, death.
In human, inhalation at 5000 ppm (9.4 mg/L) may cause respiratory tract irritation, stupor, abnormal sleep.

Specific target organ systemic toxicity - repeated exposure
In human, intake of a large amount of alcohol can cause injury in almost all organs, of which the liver is a target organ that might be adversely effected most. Fatty degeneration may occur first, leading to necrosis, fibrosis, and eventually cirrhosis.
Withdrawal symptoms in patients with alcohol intoxication (tremor, epilepsy, confusion)

Inhalation respiratory hazard
No information

12. Ecological Information

Degradability
Calculated oxygen demand (ThOD): 2.10
BOD₃  44 to 80%ThOD
COD  90 to 100%ThOD
Inhibition of bacterial nitrification: Inhibits 50% of ammonia oxidation by Nitrosomonas in 4100mg/L.

Ecological toxicity
Orange fin: LC50: 11.2 g/L/24 hours
A kind of carp: LC50: 18 to 13.4 g/L/96 hours
Creek-chub: LC50: 7 g/L/24 hours
Guppy: LC50: 11 g/L/7 days
13. Disposal Considerations

Remaining wastes shall be burned up in an incinerator by means of spraying.
Discard the product according to relevant legislation as well as standards in local governments.
Consign disposal to industrial waste disposal services or local public body certified by prefectural governors or the like. Waste disposal should be consigned to waste disposal services after they were fully informed of risks and hazards.
- Recycle containers after cleaning or dispose them according to relevant legislation as well as standards in local governments.
When discarding used containers or pipes, etc., they shall be rinsed with water in advance.
Disposal shall be in accordance with descriptions in the column of “Precautions to be taken during handling and storing”, and with other general cautions to flammable liquids.

14. Transport Information

UN Hazard Class: Class 3 (Flammable liquid)
UN No.: 1170 ETHANOL (ETHYL ALCOHOL) or ETHANOL SOLUTION (ETHYL ALCOHOL SOLUTION)
Fire Service Law: Article 2, Category 4 flammable liquid, 3 A kind of spirits in Attached Table 1 (designated volume: 400 L)
Civil Aeronautics Law: Article 194 in Regulation 3 flammable liquid (flash point: not more than 60 °C)
Civil Aeronautics Law: Notice of establishing criteria for transportation of explosive substances by air in Attached Table 1 Substances permitted to be transported
Port Regulations Law: Article 12 in Regulation 5 in Attached Table 2 on Notification of Hazardous Materials
Regulations on Transport by Ocean and Storage of Dangerous Goods: Article 2, No.1 “ハ” (1) Flammable liquid
Notice of establishing criteria for transportation of explosive substances by ocean Article 2, No.3 Flammable liquids in Attached Table 1
Law relating to the Prevention of Marine Pollution and Maritime Disaster: Ordinance of Law Class Z material of 3-“イ”-21 in Attached Table 1
In addition to the above 7. Handling and Storage, mixed loading with hazardous materials designated as Category 1 and Category 6 is placed under a ban according to the Fire Service Law.
Guideline No. for emergency first aid measures: 127 (a yellow card should be retained during transfer)
15. Regulatory Information

Fire Service Law: Under Article 2, Category 4 flammable liquid, 3. A kind of spirits in Attached Table 1 (designated volume: 400L)

Alcohol Business Act: Article 2, 90 vol-% or more alcohol

Industrial Safety and Health Law: Ordinance, Hazardous substances 4. Flammable substances in Attached Table 1 Hazardous Materials.

Ordinance, Reportable Harmful Material to notify the name, etc. 61 in Attached Table 9.

Food Sanitation Law: This product is contained in No.56, Appendix 3 “The list of items that are used as additives that are generally served as food” of “Labeling of food additives according to the Food Sanitation Law” as of May 23, 1996.

Note) This product is not applicable to "Law concerning Reporting, etc. of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management" (PRTR).

16. Other Information

Reference

The Chemical Daily Co., Ltd.: 13700 Chemical Products
Ministry of International Trade and Industry: Official Gazette (December 28, 1993)
DFGOT(1996)
ACGIH(2001)
DFGOT vol.12(1999)
IARC vol.144(1988)
ICSC(2000)
HSDB(2003)

Although this datasheet is prepared based on currently available materials, information, and data, the content, physical and chemical properties, and harm and hazards of this product might be revised according to new findings or tests. These precautions are applicable to ordinary handling. Safety measures appropriate for the usage should be taken for a special handling.

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