



Safety Data Sheet

1. Identification of the substance/mixture and of the company/undertaking

Product identifier:

Product name: Diethyl ether

SDS No. : 2954E-2

Details of the supplier of the safety data sheet

Manufacturer/Supplier: KISHIDA CHEMICAL CO., LTD.

Address: 3-1, Honmachibashi, Chuo-ku, Osaka, JAPAN

Division: Safety Management Dept. of Chemicals

Telephone number: +81-6-6946-8061

FAX: +81-6-6946-1607

e-mail address: kagakuhinanzenkanri@kishida.co.jp

2. Hazards identification

GHS classification and label elements of the product**Classification of the substance or mixture****PHYSICAL AND CHEMICAL HAZARDS**

Flammable liquids: Category 1

HEALTH HAZARDS

Acute toxicity (Oral): Category 4

Serious eye damage/eye irritation: Category 2B

Reproductive toxicity: Category 2

Specific target organ toxicity – single exposure: Category 3 (Respiratory tract irritation)

Specific target organ toxicity – single exposure: Category 3 (Narcosis)

Specific target organ toxicity – repeated exposure: Category 1 (CNS)

(Note) GHS classification without description: Not classified/Classification not possible

Label elements

Signal word: Danger

HAZARD STATEMENT

Extremely flammable liquid and vapor

Harmful if swallowed

Causes eye irritation

Suspected of damaging fertility or the unborn child

May cause respiratory irritation

May cause drowsiness or dizziness

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

PRECAUTIONARY STATEMENT**Prevention**

Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

Keep container tightly closed.

Ground/bond container and receiving equipment.

Use explosion-proof electrical/ventilating/lighting equipment.

Use only non-sparking tools.

Take precautionary measures against static discharge.

Do not breathe dust/fume/gas/mist/vapors/spray.



Use only outdoors or in a well-ventilated area.
Wash contaminated parts thoroughly after handling.
Wear protective gloves/protective clothing/eye protection/face protection.
Do not eat, drink or smoke when using this product.

Response

In case of fire: Use appropriate media other than water for extinction.
Get medical advice/attention if you feel unwell.
IF exposed or concerned: Get medical advice/attention.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
IF SWALLOWED: Rinse mouth.

Storage

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

Disposal

Dispose of contents/container in accordance with local/national regulation.

Specific Physical and Chemical hazards

Highly flammable liquid. Vapor/air mixture may explode.

3. Composition/information on ingredients**Mixture/Substance selection:****Substance**

Ingredient name:Diethyl ether
Content (%):99(min)
Chemical formula:C₂H₅OC₂H₅
Chemicals No, Japan:2-361
CAS No.:60-29-7
MW:74.12
ECNO:200-467-2

Note : The figures shown above are not the specifications of the product.

Impurities and stabilizing additives

Stabilizer: Dibutyl hydroxytoluene 1.5ppm (CAS No.128-37-0)

4. First-aid measures**Descriptions of first-aid measures****General measures**

Get medical attention/advice if you feel unwell.

IF INHALED

Remove person to fresh air and keep comfortable for breathing.
Call a POISON CENTER or doctor/physician if you feel unwell.

IF ON SKIN (or hair)

Take off immediately all contaminated clothing. Rinse skin with water/shower.
If skin irritation or rash occurs: Get medical advice/attention.

IF IN EYES

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.

IF SWALLOWED



Rinse mouth.

Call a POISON CENTER or doctor/physician if you feel unwell.

5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

In case of fire, use dry powder to extinguish.

Unsuitable extinguishing media

Indoor firefighting equipment or outdoor firefighting equipment

Sprinkler equipment

Dry-powder firefighting equipment – except for phosphate etc.,hydrogen carbonate etc.

Straight stream water extinguisher

Water mist extinguisher

Reinforcing liquid jet extinguisher

Dry-powder extinguisher – except for phosphate etc.,hydrogen carbonate etc.

Bucket of water or tank of water

Specific hazards arising from the substance or mixture

Containers may explode when heated.

Fire may produce irritating, corrosive and/or toxic gases.

Advice for firefighters

Specific fire-fighting measures

Evacuate non-essential personnel to safe area.

Special protective equipment and precautions for fire-fighters

Wear fire/flame resistant/retardant clothing.

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

Firefighters should wear self-contained breathing apparatus with full face piece operated positive pressure mode.

6. Accidental release measures

Personnel precautions, protective equipment and emergency procedures

Ventilate area until material pick up is complete.

Wear proper protective equipment.

Environmental precautions

Prevent spills from entering sewers, watercourses or low areas.

Methods and materials for containment and cleaning up

Absorb spill with inert material (dry sand, earth, et al), then place in a chemical waste container.

Preventive measures for secondary accident

Collect spillage.

7. Handling and storage

Precautions for safe handling

Preventive measures

(Exposure Control for handling personnel)

Do not breathe dust/fume/gas/mist/vapors/spray.

(Protective measures against fire and explosion)

Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

Ground/bond container and receiving equipment.

Use explosion-proof electrical/ventilating/lighting equipment.

Use only non-sparking tools.

Take precautionary measures against static discharge.



(Exhaust/ventilator)

Exhaust/ventilator should be available.

(Safety treatments)

Avoid contact with skin.

Avoid contact with eyes.

Safety Measures

Use only outdoors or in a well-ventilated area.

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

When using do not eat, drink or smoke.

Any incompatibilities

See "10.Stability and Reactivity"

Advice on general occupational hygiene

Wash contaminated parts thoroughly after handling.

Do not eat, drink or smoke when using this product.

Storage

Conditions for safe storage

Keep container tightly closed.

Store in a cool, dry place. Do not store in direct sunlight.

Container and packaging materials for safe handling

Glass

Iron

8. Exposure controls/personal protection

Control parameters

Adopted value

(Dibutyl hydroxytoluene)

ACGIH(2001) TWA: 2mg/m³(IFV) (URT irr)

(Diethyl ether)

ACGIH(1966) TWA: 400ppm;

STEL: 500ppm (CNS impair; URT irr)

OSHA-PEL

Diethyl etherTWA: 400ppm, 1200mg/m³

Exposure controls

Appropriate engineering controls

Do not use in areas without adequate ventilation.

Eye wash station should be available.

Washing facilities should be available.

Individual protection measures

Respiratory protection

Wear respiratory protection.

Hand protection

Wear protective gloves.

Eye protection

Wear eye/face protection.

9. Physical and Chemical Properties

Information on basic physical and chemical properties

Physical state: Liquid

Color: Colorless, clear

Odor: Characteristic odor

pH data is not available.

Boiling point or initial boiling point: 35°C



Boiling range data is not available.
Melting point/Freezing point: -116°C
Decomposition temperature data is not available.
Flammability (gases, liquids and solids) data is not available.
Flash point: (Diethyl ether)(C.C.) -45°C
Auto-ignition temperature: 160 through 180°C
Lower and upper explosion limit/flammability limit:
 Lower explosion limit: 1.7 vol %
 Upper explosion limit: 48 vol %
Vapor pressure: 58.6 kPa (20°C)
Relative vapor density (Air=1): 2.6
Relative density of the Vapor/air - mixture at 20°C (Air = 1): 1.9
Density and/or relative density: 0.7
Kinematic viscosity data is not available.
Solubility:
 Solubility in water: 6.9 g/100 ml (20°C)
n-Octanol/water partition coefficient: log Pow0.89
No Particle characteristics data is not available.

10. Stability and Reactivity

Reactivity

Not available.

Chemical stability

Stable under normal storage/handling conditions.

Possibility of hazardous reactions

(Diethyl ether)

The vapour is heavier than air and may travel along the ground; distant ignition possible.
As a result of flow, agitation, etc., electrostatic charges can be generated.

The substance can form explosive peroxides under the influence of light and air. Reacts violently with halogens, interhalogens, sulfur compounds and oxidants. This generates fire and explosion hazard. Attacks plastics and rubber. (ICSC 0355)

(Dibutyl hydroxytoluene)

Decomposes on burning. Decomposes on contact with oxidizing materials. (ICSC 0841)

Conditions to avoid

Contact with incompatible materials.

Contact with fire source.

Incompatible materials

Oxidizing agents, Halogens, Interhalogens, Sulfur compounds

Hazardous decomposition products

Carbon oxides, Explosive peroxides

11. Toxicological Information

Information on toxicological effects

Acute toxicity

Acute toxicity (Oral)

[GHS Cat. Japan, base data]

(Dibutyl hydroxytoluene)

rat LD50=2450mg/kg (DFGOT vol.23, 2007)

(Diethyl ether)

rat LD50=1207mg/kg (PATTY 6th, 2012)

Acute toxicity (Dermal)

[GHS Cat. Japan, base data]



(Dibutyl hydroxytoluene)
rat LD50 >2000mg/kg (SIDS, 2002)
(Diethyl ether)
rabbit LD50=14200mg/kg (PATTY 6th, 2012)

Acute toxicity (Inhalation)
[GHS Cat. Japan, base data]
(Diethyl ether)
vapor: rat LC50=32000ppm/4hr (PATTY 6th, 2012)

Irritant properties

Skin corrosion/irritation data is not available.
Serious eye damage/irritation
[GHS Cat. Japan, base data]
(Dibutyl hydroxytoluene)
rabbit recover after 72hours (SIDS, 2002)
(Diethyl ether)
rabbit mild irritation (DFGOT vol.13, 1999; PATTY 6th, 2012)

Allergenic and sensitizing effects data is not available.

Mutagenic effects data is not available.

Carcinogenicity

(Dibutyl hydroxytoluene)
IARC-Gr.3 : Not Classifiable as a Human Carcinogen
(Dibutyl hydroxytoluene)
ACGIH-A4(2001) : Not Classifiable as a Human Carcinogen

Reproductive toxicity

[GHS Cat. Japan, base data]
(Diethyl ether)
cat. 2; rat : DFGOT vol.13, 1999; HSDB Access on Aug. 2017

STOT

STOT-single exposure
[cat.3 (resp. irrit.)]
[GHS Cat. Japan, base data]
(Diethyl ether)
respiratory tract irritation (DFGOT vol.13, 1999; ACGIH 7th, 2001)
[cat.3 (drow./dizz.)]
[GHS Cat. Japan, base data]
(Diethyl ether)
narcosis (DFGOT vol.13, 1999; PATTY 6th, 2012)

STOT-repeated exposure

[cat.1]
[GHS Cat. Japan, base data]
(Diethyl ether)
CNS (ACGIH 7th, 2001)

Aspiration hazard data is not available.

12. Ecological Information

Ecotoxicity

Aquatic toxicity

Aquatic acute toxicity component(s) data
[GHS Cat. Japan, base data]
(Diethyl ether)
Fish (fat head minnow) LC50=2560mg/L/96hr (NLM HSDB, 2014; EPA Aquire, 2017; Geiger, D.L. et al., 1986)
(Dibutyl hydroxytoluene)



Crustacea (Daphnia magna) EC50=0.84mg/L/48hr (MOE Japan, 1999)
Aquatic chronic toxicity component(s) data
[GHS Cat. Japan, base data]
(Dibutyl hydroxytoluene)
Fish (Atheriniformes) ELS NOEC=0.053mg/L (MOE Japan, 2007)
Water solubility
(Diethyl ether)
6.04 g/100 ml (PHYSPROP_DB, 2005)
(Dibutyl hydroxytoluene)
0.00006 g/100 ml (25°C) (ICSC, 1999)
Persistence and degradability
(Diethyl ether)
Not degrade rapidly (Degradability by GC: 13% (CSCL DB: 1985))
(Dibutyl hydroxytoluene)
Not degrade rapidly (BOD_Degradation : 4.5% (Registered chemicals data check & review 1979))
Bioaccumulative potential
(Diethyl ether)
log Pow=0.89 (ICSC, 2002)
(Dibutyl hydroxytoluene)
log Pow=5.1 (ICSC, 1999); BCF=2800 (Check & Review, Japan)
Mobility in soil
Mobility in soil data is not available.
Other adverse effects
Ozone depleting chemical data is not available.

13. Disposal considerations

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging

Waste treatment methods

Dispose of contents/container in accordance with local/national regulation.

14. Transport Information

UN No.: 1155

Proper Shipping Name :

DIETHYL ETHER (ETHYL ETHER)

Class or division : 3

Packing group : I

ERG GUIDE No.: 127

IMDG Code (International Maritime Dangerous Goods Regulations)

UN No.: 1155

Proper Shipping Name :

DIETHYL ETHER (ETHYL ETHER)

Class or division : 3

Packing group : I

IATA Dangerous Goods Regulations

UN No.: 1155

Proper Shipping Name :

DIETHYL ETHER (ETHYL ETHER)

Class or division : 3

Hazard labels : Flamm.liquid

Packing group : I

Environmental hazards



MARPOL Annex III – Prevention of pollution by harmful substances

Marine pollutants (yes/no) : no

MARPOL Annex V – Prevention of pollution by garbage discharge

Specific target organ toxicity – repeated exposure: cat.1

Diethyl ether

Transport in bulk according to Annex II of MARPOL73/78 and IBC Code

Noxious Liquid ; Cat. Z

Diethyl ether

15. Regulatory Information

Safety, health and environmental regulations/legislation specific for the substance or mixture

US major regulations

Chemicals listed in TSCA Inventory

Diethyl ether; Dibutyl hydroxytoluene

Other regulatory information

Ensure this material in compliance with federal requirements and ensure conformity to local regulations.

16. Other information

GHS classification and labelling

Flam. Liq. 1: H224 Extremely flammable liquid and vapor

Acute Tox. 4: H302 Harmful if swallowed

Eye Irrit. 2B: H320 Causes eye irritation

Repr. 2: H361 Suspected of damaging fertility or the unborn child

STOT SE 3: H335 May cause respiratory irritation

STOT SE 3: H336 May cause drowsiness or dizziness

STOT RE 1: H372 Causes damage to organs through prolonged or repeated exposure

Reference Book

Globally Harmonized System of classification and labelling of chemicals, (6th ed., 2015), UN

Recommendations on the TRANSPORT OF DANGEROUS GOODS 20th edit., 2017 UN

IMDG Code, 2018 Edition (Incorporating Amendment 39-18)

IATA Dangerous Goods Regulations (60th Edition) 2019

Classification, labelling and packaging of substances and mixtures (table3-1 ECNO6182012)

2016 EMERGENCY RESPONSE GUIDEBOOK (US DOT)

2019 TLVs and BEIs. (ACGIH)

<http://monographs.iarc.fr/ENG/Classification/index.php>

Supplier's data/information

General Disclaimer

This data sheet was created based on the information we currently have and may be revised according to new information. In addition, the precautions apply only to normal handling, and in the case of special handling, please make adequate countermeasure to maintain your safety.

The data given here is based on current knowledge and experience. The purpose of this Safety Data Sheet is to describe the products in terms of their safety requirements. The data does not signify any warranty with regard to the products' properties.

The GHS classification data given here is based on current Japan official data (NITE published in 2018).