



Safety Data Sheet

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

Product identifier:

Product name: Tetrahydrofuran

SDS No. : 7681E-3

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

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2. Hazards identification

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

Flammable liquids: Category 2

HEALTH HAZARDS

Acute toxicity (Oral): Category 4

Acute toxicity (Inhalation): Category 4

Skin corrosion/irritation: Category 2

Serious eye damage/eye irritation: Category 2

Carcinogenicity: Category 2

Reproductive toxicity: Category 2

Specific target organ toxicity – single exposure: Category 1(central nervous system)

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(central nervous system;
respiratory system; liver)**Label elements**

Signal word: Danger

HAZARD STATEMENT

Highly flammable liquid and vapor

Harmful if swallowed

Harmful if inhaled

Causes skin irritation

Causes serious eye irritation

Suspected of causing cancer

Suspected of damaging fertility or the unborn child

Causes damage to organs(central nervous system)

May cause respiratory irritation

May cause drowsiness or dizziness

Causes damage to organs through prolonged or repeated exposure(central nervous system;
respiratory system; liver)

**PRECAUTIONARY STATEMENT****Prevention**

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 non-sparking tools.

Take action to prevent static discharges.

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 to extinguish.

Get medical advice/attention if you feel unwell.

IF exposed or concerned: Get medical advice/attention.

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

IF exposed or concerned: Call a POISON CENTER/doctor/physician.

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

IF ON SKIN: Wash with plenty of soap and water.

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.

If skin irritation occurs: Get medical advice/attention.

Take off contaminated clothing and wash it before reuse.

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/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:Tetrahydrofuran

Content (%):99(min)

Chemical formula:C₄H₈O

Chemicals No, Japan:5-53

CAS No.:109-99-9

MW:72.11

ECNO:203-726-8

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

Stabilizing additives

Dibutyl hydroxytoluene 0.025% (CAS No.128-37-0)



4. First-aid measures

Descriptions of first-aid measures

General measures

Get medical advice/attention if you feel unwell.

IF INHALED

Remove person to fresh air and keep comfortable for breathing.

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

IF ON SKIN (or hair)

Take off immediately all contaminated clothing. Rinse skin with water or shower.

Wash with plenty of soap and water.

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/doctor/physician if you feel unwell.

5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

In case of fire, use water mist, foam, dry powder, CO₂ 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 resistant or flame 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, hot surfaces, sparks, open flames and other ignition sources. No smoking.

Ground and bond container and receiving equipment.

Use explosion-proof electrical/ventilating/lighting equipment.

Use non-sparking tools.

Take action to prevent static discharges.

(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.

Take off contaminated clothing and wash it before reuse.

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

(Tetrahydrofuran)

ACGIH(2005) TWA: 50ppm;

STEL: 100ppm (URT irr; CNS impair; kidney dam)

(Dibutyl hydroxytoluene)

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

Notation

(Tetrahydrofuran)

Skin

OSHA-PEL

(Tetrahydrofuran)



TWA: 200ppm, 590mg/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

Odor: Characteristic odor

Melting point/Freezing point: -108.5°C

Boiling point or initial boiling point: (Tetrahydrofuran)66°C

Boiling range data is not available.

Flammability (gases, liquids and solids) data is not available.

Lower and upper explosion limit/flammability limit:

Lower explosion limit: 2.0 vol %

Upper explosion limit: 11.8 vol %

Flash point: (Tetrahydrofuran)(C.C.) -14.5°C

Auto-ignition temperature: (Tetrahydrofuran)321°C

Decomposition temperature data is not available.

pH data is not available.

Dynamic viscosity: 0.5 mPas (20°C)

Kinematic viscosity data is not available.

Solubility:

Solubility in water: Miscible

n-Octanol/water partition coefficient data is not available.

Vapor pressure: 19.3 kPa (20°C)

Density and/or relative density: 0.89

Relative vapor density (Air=1): 2.5

Relative density of the Vapor/air - mixture at 20°C (Air = 1): 1.28

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

The vapour is heavier than air and may travel along the ground; distant ignition possible.

The substance can form explosive peroxides. Reacts violently with strong oxidants, strong bases and some metal halides. This generates fire and explosion hazard. Attacks some forms of plastic, rubber and coatings. (ICSC 0578)

Conditions to avoid



Contact with incompatible materials.

Contact with fire source.

Incompatible materials

Strong bases, Strong oxidizing agents, Metal halides

Hazardous decomposition products

Carbon oxides, Explosive peroxides

11. Toxicological Information

Information on toxicological effects

Acute toxicity

Acute toxicity (Oral)

[GHS Cat. Japan, base data]

(Tetrahydrofuran)

rat LD50=1650mg/kg (MOE risk assessment vol.5, 2006)

(Dibutyl hydroxytoluene)

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

Acute toxicity (Dermal)

[GHS Cat. Japan, base data]

(Dibutyl hydroxytoluene)

rat LD50 >2000mg/kg (SIDS, 2002)

Acute toxicity (Inhalation)

[GHS Cat. Japan, base data]

(Tetrahydrofuran)

vapor: rat LC50=18187ppm/4hr (MOE risk assessment vol.5, 2006)

Irritant properties

Skin corrosion/irritation

[GHS Cat. Japan, base data]

(Tetrahydrofuran)

human skin, eye and mucous membrane irritation (ACGIH, 2005 et al)

Serious eye damage/irritation

[GHS Cat. Japan, base data]

(Tetrahydrofuran)

rabbit moderate irritation (ACGIH 7th, 2005))

(Dibutyl hydroxytoluene)

rabbit recover after 72hours (SIDS, 2002)

Allergenic and sensitizing effects data is not available.

Mutagenic effects data is not available.

Carcinogenicity

[GHS Cat. Japan, base data]

(Tetrahydrofuran)

cat.2; ACGIH A3 (ACGIH 7th, 2001 et al.)

(Tetrahydrofuran)

IARC-Gr.2B : Possibly carcinogenic to humans

(Dibutyl hydroxytoluene)

IARC-Gr.3 : Not Classifiable as a Human Carcinogen

(Tetrahydrofuran)

ACGIH-A3(2005) : Confirmed Animal Carcinogen with Unknown Relevance to Humans

(Dibutyl hydroxytoluene)

ACGIH-A4(2001) : Not Classifiable as a Human Carcinogen

(Tetrahydrofuran)

EU-Category 2; Substances suspected human carcinogens

Reproductive toxicity

[GHS Cat. Japan, base data]



(Tetrahydrofuran)
cat. 2; mouse : IRIS TR, 2012

STOT

STOT-single exposure

[cat.1]

[GHS Cat. Japan, base data]
(Tetrahydrofuran)
central nervous system (HSDB, 2014)

[cat.3 (resp. irrit.)]

[GHS Cat. Japan, base data]
(Tetrahydrofuran)
respiratory tract irritation (HSDB, 2014)

[cat.3 (drow./dizz.)]

[GHS Cat. Japan, base data]
(Tetrahydrofuran)
narcotic effect (HSDB, 2014)

STOT-repeated exposure

[cat.1]

[GHS Cat. Japan, base data]
(Tetrahydrofuran)
central nervous system; respiratory system; liver (IRIS TR, 2012)

Aspiration hazard data is not available.

12. Ecological Information

Ecotoxicity

Aquatic toxicity

Hazardous to the aquatic environment (Acute)

[GHS Cat. Japan, base data]
(Tetrahydrofuran)
Fish (fat head minnow) LC50=2160mg/L/96hr (ECETOC TR91, 2003)
(Dibutyl hydroxytoluene)
Crustacea (Daphnia magna) EC50=0.84mg/L/48hr (MOE Japan, 1999)

Hazardous to the aquatic environment (Long-term)

[GHS Cat. Japan, base data]
(Tetrahydrofuran)
Fish (fat head minnow) NOEC=216mg/L/35-38days (MOE Japan, 2009)
(Dibutyl hydroxytoluene)
Fish (Atheriniformes) ELS NOEC=0.053mg/L (MOE Japan, 2007)

Water solubility

(Tetrahydrofuran)
miscible (ICSC, 1997)
(Dibutyl hydroxytoluene)
0.00006 g/100 ml (25°C) (ICSC, 1999)

Persistence and degradability

(Tetrahydrofuran)
Degrade rapidly (BOD_Degradation : 100% (Registered chemicals data check & review, 1975))
(Dibutyl hydroxytoluene)
Not degrade rapidly (BOD_Degradation : 4.5% (Registered chemicals data check & review 1979))

Bioaccumulative potential

(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. or ID No.: 2056

UN Proper Shipping Name :

TETRAHYDROFURAN

Class or division (Transport hazard class) : 3

Packing group : II

ERG GUIDE No.: 127

IMDG Code (International Maritime Dangerous Goods Regulations)

UN No.: 2056

Proper Shipping Name :

TETRAHYDROFURAN

Class or division : 3

Packing group : II

IATA Dangerous Goods Regulations

UN No.: 2056

Proper Shipping Name :

TETRAHYDROFURAN

Class or division : 3

Hazard labels : Flamm.liquid

Packing group : II

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

Tetrahydrofuran

Maritime transport in bulk according to IMO instruments

Noxious Liquid ; Cat. Z

Tetrahydrofuran

15. Regulatory Information

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

Chemicals listed in TSCA Inventory

Tetrahydrofuran; 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. 2: H225 Highly flammable liquid and vapor
Acute Tox. 4: H302 Harmful if swallowed
Acute Tox. 4: H332 Harmful if inhaled
Skin Irrit. 2: H315 Causes skin irritation
Eye Irrit. 2: H319 Causes serious eye irritation
Carc. 2: H351 Suspected of causing cancer
Repr. 2: H361 Suspected of damaging fertility or the unborn child
STOT SE 1: H370 Causes damage to organs
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, UN
Recommendations on the TRANSPORT OF DANGEROUS GOODS 21th edit., 2019 UN
IMDG Code, 2018 Edition (Incorporating Amendment 39-18)
IATA Dangerous Goods Regulations (62nd Edition) 2021
2020 EMERGENCY RESPONSE GUIDEBOOK (US DOT)
2021 TLVs and BEIs. (ACGIH)
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 2019).