



Safety Data Sheet

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

Product identifier:

Product name: Furfural

SDS No. : 3285E-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

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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 3

HEALTH HAZARDS

Acute toxicity (Oral): Category 3

Acute toxicity (Dermal): Category 3

Acute toxicity (Inhalation): Category 2

Skin corrosion/irritation: Category 2

Serious eye damage/eye irritation: Category 2A

Carcinogenicity: Category 2

Specific target organ toxicity – single exposure: Category 1(respiratory system; liver)

Specific target organ toxicity – repeated exposure: Category 1(respiratory system; liver)

ENVIRONMENT HAZARDS

Hazardous to the aquatic environment (Acute): Category 3

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

Label elements

Signal word: Danger

HAZARD STATEMENT

Flammable liquid and vapor

Toxic if swallowed

Toxic in contact with skin

Fatal if inhaled

Causes skin irritation

Causes serious eye irritation

Suspected of causing cancer

Causes damage to organs after single exposure(respiratory system; liver)

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

Harmful to aquatic life

PRECAUTIONARY STATEMENT

Prevention



Avoid release to the environment.
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.
In case of inadequate ventilation wear respiratory protection. (as specified by the manufacturer/supplier or the competent authority.)
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.
Call a POISON CENTER or doctor/physician if you feel unwell.
IF exposed or concerned: Call a POISON CENTER or 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/shower.
If skin irritation occurs: Get medical advice/attention.
Take off immediately all contaminated clothing and wash it before reuse.
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: Immediately call a POISON CENTER or doctor/physician.
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

Flammable liquid. Vapor/air mixture may explode.

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

Ingredient name:Furfural

Content (%):98(min)

Chemical formula:C₅H₄O₂

Chemicals No, Japan:5-40

CAS No.:98-01-1

MW:96.09

ECNO:202-627-7

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



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.

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.

Immediately call a POISON CENTER or doctor/physician.

5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

In case of fire, use 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

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.

Take off immediately all 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

(Furfural)

ACGIH(2016) TWA: 0.2ppm (URT & eye irr)

Notation

(Furfural)

Skin

OSHA-PEL

(Furfural)

TWA: 5ppm, 20mg/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 to light brown

Odor: Characteristic odor

Melting point/Freezing point: -36.5°C

Boiling point or initial boiling point: (Furfural)162°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: 2.1 vol %

Upper explosion limit: 19.3 vol %

Flash point: (Furfural)(C.C.) 60°C

Auto-ignition temperature: (Furfural)315°C

Decomposition temperature data is not available.

pH data is not available.

Kinematic viscosity: 1.28 mm²/s (25°C)

Solubility:

Solubility in water: 8.3 g/100 ml (20°C)

n-Octanol/water partition coefficient: log Pow0.46

Vapor pressure: 0.15 kPa (20°C)

Density and/or relative density: 1.16

Relative vapor density (Air=1): 3.3

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

No Particle characteristics data is not available.

10. Stability and Reactivity**Reactivity**

Not available.

Chemical stability

Turns red-brown on exposure to air and light. (ICSC 0276)

Possibility of hazardous reactions

The substance polymerizes under the influence of acids or bases. This generates fire or explosion hazard. Reacts with oxidants. Attacks some forms of plastic. (ICSC 0276)

Conditions to avoid

Contact with incompatible materials.

Contact with fire source.

Incompatible materials

Acids, Bases, Oxidizing agents

Hazardous decomposition products

Carbon oxides

11. Toxicological Information

Information on toxicological effects

Acute toxicity

Acute toxicity (Oral)

[GHS Cat. Japan, base data]

(Furfural)

rat LD50=50-100mg/kg (JSOH, 1989); 50-149mg/kg (EU-RAR, 2008) et al.

Acute toxicity (Dermal)

[GHS Cat. Japan, base data]

(Furfural)

rabbit LD50=310-1000mg/kg (EU-RAR, 2008)

Acute toxicity (Inhalation)

[GHS Cat. Japan, base data]

(Furfural)

vapor: rat LC50=95ppm/4hr (cal.) (CICAD 21, 2000; DFGOT vol. 9); rat LC50=153ppm/4hr (EU-RAR, 2008) et al; < 90% of saturated vapor press. conc. (2917ppm)

Irritant properties

Skin corrosion/irritation

[GHS Cat. Japan, base data]

(Furfural)

rabbit/human irritation (EU-RAR, 2008; JSOH, 1989; IARC 63, 1995; CICAD 21, 2000)

Serious eye damage/irritation

[GHS Cat. Japan, base data]

(Furfural)

rabbit recover after 9 days (EU-RAR, 2008); rabbit recover after 24hr (ACGIH 7th, 2001)

Allergenic and sensitizing effects data is not available.

Mutagenic effects data is not available.

Carcinogenicity

[GHS Cat. Japan, base data]

(Furfural)

cat.2; EU Carc. 2 (EU-RAR, 2008); ACGIH A3 (ACGIH 7th, 2017)

(Furfural)

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

(Furfural)

ACGIH-A3(2016) : Confirmed Animal Carcinogen with Unknown Relevance to Humans

(Furfural)

EU-Category 2; Substances suspected human carcinogens

Reproductive toxicity data is not available.

STOT

STOT-single exposure

[cat.1]

[GHS Cat. Japan, base data]

(Furfural)

respiratory system; liver (DFGOT vol. 9, 1998; CICAD 21, 2000; ACGIH 7th, 2017; EU-RAR, 2008; JSOH, 1989; IARC 63, 1995)

STOT-repeated exposure

[cat.1]

[GHS Cat. Japan, base data]

(Furfural)

respiratory system; liver (ACGIH 7th, 2017; JSOH, 1989; ACGIH 7th, 2001; EU-RAR, 2008; NTP TR 382, 1990)

Aspiration hazard data is not available.



12. Ecological Information

Ecotoxicity

Aquatic toxicity

Harmful to aquatic life

Hazardous to the aquatic environment (Acute)

[GHS Cat. Japan, base data]

(Furfural)

Fish (*Gambusia affinis*) LC50=24mg/L/96hr (EU-RAR, 2008; WHO IPCS CICAD, 2000)

Hazardous to the aquatic environment (Long-term)

[GHS Cat. Japan, base data]

(Furfural)

Crustacea (*Daphnia magna*) NOEC=1.9mg/L/21days (EU-RAR, 2008)

Water solubility

(Furfural)

8.3 g/100 ml (20°C) (ICSC, 2012)

Persistence and degradability

(Furfural)

Degrade rapidly (BOD_Degradation : 93.5% (Registered chemicals data check & review, 1976))

Bioaccumulative potential

(Furfural)

log Kow=0.41 (SRC PHYSPROP DB, 2017)

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

Avoid release to the environment (- if this is not the intended use).

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

14. Transport Information

UN No.: 1199

Proper Shipping Name :

FURALDEHYDES

Class or division : 6.1

Subsidiary hazard(s) : 3

Packing group : II

ERG GUIDE No.: 132P

IMDG Code (International Maritime Dangerous Goods Regulations)

UN No.: 1199

Proper Shipping Name :

FURALDEHYDES

Class or division : 6.1

Subsidiary hazard(s) : 3

Packing group : II

IATA Dangerous Goods Regulations

UN No.: 1199

Proper Shipping Name :

**FURALDEHYDES**

Class or division : 6.1

Subsidiary hazard(s) : 3

Hazard labels : Toxic & 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

Furfural

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

Noxious Liquid ; Cat. Y

Furfural

15. Regulatory Information

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

US Federal Regulations

Chemicals listed in TSCA Inventory

Furfural

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. 3: H226 Flammable liquid and vapor

Acute Tox. 3: H301 Toxic if swallowed

Acute Tox. 3: H311 Toxic in contact with skin

Acute Tox. 2: H330 Fatal if inhaled

Skin Irrit. 2: H315 Causes skin irritation

Eye Irrit. 2A: H319 Causes serious eye irritation

Carc. 2: H351 Suspected of causing cancer

STOT SE 1: H370 Causes damage to organs after single exposure

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

Aquatic Acute 3: H402 Harmful to aquatic life

Reference Book

Globally Harmonized System of classification and labelling of chemicals, (7th revised edition, 2017), UN

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

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

IATA Dangerous Goods Regulations (61th Edition) 2020

Classification, labelling and packaging of substances and mixtures (Table 3 ECNO6182012)

2016 EMERGENCY RESPONSE GUIDEBOOK (US DOT)

2020 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 2019).