

SAFETY DATA SHEETS

According to the UN GHS revision 9

Version: 1.0
Creation Date: July 15, 2019
Revision Date: July 15, 2019

SECTION 1: Identification

1.1 GHS Product identifier

Product name 2-furaldehyde

1.2 Other means of identification

Product number -
Other names 2-furancarboxaldehyde; 2-Furancarbothioic acid,O-ethyl ester;
Furfural

1.3 Recommended use of the chemical and restrictions on use

Identified uses Industrial and scientific research use.
Uses advised against no data available

1.4 Supplier's details

Company Shanghai Yansheng Internet Technology Co., Ltd
Address 513, A3 / F, green space future center, Fengxian District,
Shanghai, 201400, China
Telephone +86-4000-6969-66

1.5 Emergency phone number

Emergency phone number +86-4000-6969-66
Service hours Monday to Friday, 9am-5pm (Standard time zone: UTC/GMT +8 hours).

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

Acute toxicity - Category 3, Oral
Acute toxicity - Category 4, Dermal
Skin irritation, Category 2
Eye irritation, Category 2
Acute toxicity - Category 3, Inhalation
Specific target organ toxicity – single exposure, Category 3
Carcinogenicity, Category 2

2.2 GHS label elements, including precautionary statements

Pictogram(s)



Signal word Danger
Hazard statement(s) H301 Toxic if swallowed
H312 Harmful in contact with skin

H315 Causes skin irritation
H319 Causes serious eye irritation
H331 Toxic if inhaled
H335 May cause respiratory irritation
H351 Suspected of causing cancer

Precautionary statement(s)

Prevention

P264 Wash ... thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.
P203 Obtain, read and follow all safety instructions before use.

Response

P301+P316 IF SWALLOWED: Get emergency medical help immediately.
P321 Specific treatment (see ... on this label).
P330 Rinse mouth.
P302+P352 IF ON SKIN: Wash with plenty of water/...
P317 Get medical help.
P362+P364 Take off contaminated clothing and wash it before reuse.
P332+P317 If skin irritation occurs: Get medical help.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P316 Get emergency medical help immediately.
P319 Get medical help if you feel unwell.
P318 IF exposed or concerned, get medical advice.

Storage

P405 Store locked up.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.

Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

2.3 Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration
2-furaldehyde	2-furaldehyde	98-01-1	202-627-7	100%

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

If inhaled

Fresh air, rest. Refer for medical attention. See Notes.

Following skin contact

Remove contaminated clothes. Rinse skin with plenty of water or shower. Seek medical attention if you feel unwell.

Following eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Following ingestion

Rinse mouth. Refer for medical attention .

4.2 Most important symptoms/effects, acute and delayed

Vapor may irritate eyes and respiratory system. Liquid irritates skin and may cause dermatitis. (USCG, 1999)

4.3 Indication of immediate medical attention and special treatment needed, if necessary

Basic treatment: Establish a patent airway. Suction if necessary. Watch for signs of respiratory insufficiency and assist ventilations if necessary. Aggressive airway management may be necessary. Administer oxygen by nonrebreather mask at 10 to 15 L/min. Anticipate seizures and treat if necessary . Monitor for shock and treat if necessary . Monitor for pulmonary edema and treat if necessary . For eye contamination, flush eyes immediately with water. Irrigate each eye continuously with normal saline during transport . Do not use emetics. For ingestion, rinse mouth and administer 5 ml/kg up to 200 ml of water for dilution if the patient can swallow, has a strong gag reflex, and does not drool. Administer activated charcoal . Aldehydes and Related Compounds

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

Use water spray, dry chemical, "alcohol resistant" foam, or carbon dioxide. use water spray to keep fire-exposed containers cool.

5.2 Specific hazards arising from the chemical

Special Hazards of Combustion Products: Irritating vapors are generated when heated (USCG, 1999)

5.3 Special protective actions for fire-fighters

Use water spray, powder, alcohol-resistant foam, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal protection: filter respirator for organic gases and particulates adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

6.2 Environmental precautions

Personal protection: filter respirator for organic gases and particulates adapted to the airborne concentration of the substance. Do NOT let this chemical enter the environment. Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

6.3 Methods and materials for containment and cleaning up

1. Remove all ignition sources. 2. Ventilate area of spill or leak. 3. For small quantities, absorb on paper towels. Evaporate in a safe place ... Allow sufficient time for evaporating vapors to completely clear the hood ductwork. Burn the paper in a suitable location away from combustible materials. For large quantities, cover with sodium bisulfite, add a small amt of water & mix. ... After 1 hr, flush with large amt of water & wash site with soap solution.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

NO open flames, NO sparks and NO smoking. Above 60°C use a closed system, ventilation and explosion-proof electrical equipment. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of

dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

7.2 Conditions for safe storage, including any incompatibilities

Separated from strong bases, strong acids, strong oxidants and food and feedstuffs. Keep in the dark. Well closed. Ventilation along the floor. Store in an area without drain or sewer access. Keep in air tight container and protect from light

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

TLV: 0.2 ppm as TWA; (skin); A3 (confirmed animal carcinogen with unknown relevance to humans); BEI issued. MAK: skin absorption (H); carcinogen category: 3B

Biological limit values

no data available

8.2 Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear face shield or eye protection in combination with breathing protection.

Skin protection

Protective gloves.

Respiratory protection

Use ventilation, local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state	Liquid.
Colour	Colourless Turns yellow to brown on exposure to air and light and resinifies.
Odour	Peculiar odor, somewhat resembling the odor of benzaldehyde
Melting point/freezing point	-36.5 °C.
Boiling point or initial boiling point and boiling range	161.8 °C. Atm. press.:760 mm Hg.
Flammability	Class IIIA Combustible Liquid: Fl.P. at or above 140°F and below 200°F.
Lower and upper explosion limit/flammability limit	Lower flammable limit: 2.1% by volume; Upper flammable limit: 19.3% by volume
Flash point	61.7 °C. Atm. press.:See remarks.
Auto-ignition temperature	> 315 - < 393 °C. Atm. press.:See remarks.
Decomposition temperature	Remarks:Information on pressure not reported.
pH	no data available
Kinematic viscosity	no data available cps = Ca. 1.49. Temperature:25.0°C.

Solubility	Partially miscible with water
Partition coefficient n-octanol/water	log Pow = Ca. 0.41. Remarks: Value is based on a QSAR.
Vapour pressure	16.9 hPa. Temperature: 55 °C.
Density and/or relative density	Ca. 1.15 - ca. 1.16 g/cm ³ . Temperature: 25 °C.
Relative vapour density	3.31 (vs air)
Particle characteristics	no data available

SECTION 10: Stability and reactivity

10.1 Reactivity

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

10.2 Chemical stability

Turns yellow to brown on exposure to air and light and resinifies

10.3 Possibility of hazardous reactions

Flammability of furfural is comparable to that of kerosene or No 1 fuel oil. FURFURAL reacts with sodium hydrogen carbonate. It also can react with strong oxidizers. An exothermic resinification of almost explosive violence can occur upon contact with strong mineral acids or alkalis. It forms condensation products with many types of compounds, including phenol, amines and urea. (NTP, 1992).

10.4 Conditions to avoid

no data available

10.5 Incompatible materials

Can react with oxidizing materials.

10.6 Hazardous decomposition products

When heated to decomposition it emits acrid smoke and irritating fumes.

SECTION 11: Toxicological information

Acute toxicity

- Oral: LD50 - rat (male) - 100 mg/kg bw. Remarks: 5/10 mortalities at 100 mg/kg.
- Inhalation: LC50 - rat (male/female) - > 0.54 - < 1.63 mg/L air (analytical).
- Dermal: LD50 - rat (male/female) - > 2 000 mg/kg bw.

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

Evaluation: There is inadequate evidence in humans for the carcinogenicity of furfural. There is limited evidence in experimental animals for the carcinogenicity of furfural. Overall evaluation: Furfural is not classifiable as to its carcinogenicity to humans (Group 3).

Reproductive toxicity

no data available

STOT-single exposure

The substance is mildly irritating to the skin. The substance is irritating to the eyes and respiratory tract. If swallowed the substance may cause vomiting and could result in aspiration pneumonitis.

STOT-repeated exposure

The substance defats the skin, which may cause dryness or cracking. The substance may have effects on the liver. Tumours have been detected in experimental animals but may not be relevant to humans.

Aspiration hazard

No indication can be given about the rate at which a harmful concentration of this substance in the air is reached on evaporation at 20°C.

SECTION 12: Ecological information

12.1 Toxicity

- Toxicity to fish: LC50 - *Poecilia reticulata* - 10.5 mg/L - 14 d.
- Toxicity to daphnia and other aquatic invertebrates: EC0 - *Daphnia magna* - 13 mg/L - 24 h.
- Toxicity to algae: NOEC - *Microcystis aeruginosa* - 2.7 mg/L - 8 d.
- Toxicity to microorganisms: EC50 - activated sludge - 760 mg/L - 30 min.

12.2 Persistence and degradability

AEROBIC: Furfural, present at 100 mg/L, reached 93.5% of its theoretical BOD in 2 weeks using an activated sludge inoculum at 30 mg/L and the Japanese MITI test(1). In river die-away studies using water taken from the Great Miami, Little Miami, and Ohio Rivers, 1.0 ppm of furfural was completely degraded within 3 days under aerobic conditions(2). The rate of degradation at a higher initial furfural concentration was found to be dependent upon the degree of acclimation, and fully acclimated seeds were found to degrade 25 ppm furfural within 5-12 days(2). At initial concentrations of 1.7-20 and 440 ppm, furfural underwent 46% and 17% theoretical BOD, respectively, in 5 days using a sewage sludge seed under aerobic conditions(3). Furfural at an initial concentration of 300 mg/L, in solution with phenol and N-methyl-2-pyrrolidine, was found to undergo 98% removal in a flow-through laboratory bioreactor using an activated sludge inoculum under aerobic conditions(4). At an initial feed concentration of 1,000 mg/L, degradation was also found to occur(4). Furfural at an initial concentration of 200 mg/L COD underwent 96.3% removal in less than 120 hours using a thickened adapted activated sludge under aerobic conditions (5). Furfural was shown to support the aerobic growth of organisms obtained from soil and grown on phenol(6).

12.3 Bioaccumulative potential

An estimated BCF of 3.2 was calculated for furfural(SRC), using a log Kow of 0.41(1) and a regression-derived equation(2). According to a classification scheme(3), this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC).

12.4 Mobility in soil

The Koc of furfural is estimated as 40(SRC), using a log Kow of 0.41(1) and a regression-derived equation(2). According to a classification scheme(3), this estimated Koc value suggests that furfural is expected to have very high mobility in soil.

12.5 Other adverse effects

no data available

SECTION 13: Disposal considerations

13.1 Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

14.1 UN Number

ADR/RID: UN1199 (For reference only, please check.)

IMDG: UN1199 (For reference only, please check.)

IATA: UN1199 (For reference only, please check.)

14.2 UN Proper Shipping Name

ADR/RID: FURALDEHYDES (For reference only, please check.)

IMDG: FURALDEHYDES (For reference only, please check.)

IATA: FURALDEHYDES (For reference only, please check.)

14.3 Transport hazard class(es)

ADR/RID: 6.1 (For reference only, please check.)

IMDG: 6.1 (For reference only, please check.)

IATA: 6.1 (For reference only, please check.)

14.4 Packing group, if applicable

ADR/RID: II (For reference only, please check.)

IMDG: II (For reference only, please check.)

IATA: II (For reference only, please check.)

14.5 Environmental hazards

ADR/RID: No

IMDG: No

IATA: No

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number
2-furaldehyde	2-furaldehyde	98-01-1	202-627-7
European Inventory of Existing Commercial Chemical Substances (EINECS)			Listed.
EC Inventory			Listed.
United States Toxic Substances Control Act (TSCA) Inventory			Listed.
China Catalog of Hazardous chemicals 2015			Listed.
New Zealand Inventory of Chemicals (NZIoC)			Listed.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)			Listed.
Vietnam National Chemical Inventory			Listed.
Chinese Chemical Inventory of Existing Chemical Substances (China IECSC)			Listed.
Korea Existing Chemicals List (KECL)			Listed.

SECTION 16: Other information

Information on revision

Creation Date July 15, 2019
Revision Date July 15, 2019

Abbreviations and acronyms

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

References

- IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>
- HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>
- IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>
- eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
- CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>
- ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>
- ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>
- Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>
- ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

Other Information

Refer for medical attention if breathing difficulties and/or fever develop.

Any questions regarding this SDS, Please send your inquiry to sds@xixisis.com

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