

Safety Data Sheet

1. Chemical product and company identification

Product name : Furan

Company information

Name of manufacturer : KANTO CHEMICAL CO., INC.
 Address : 2-1, Nihonbashi, Muromachi 2-Chome, Chuo-Ku, Tokyo, 103-0022, JP
 Name of section : Business Administration Department, Reagent Division
 Telephone number : +81-3-6214-1090
 Facsimile number : +81-3-3241-1047
 Mail address : BC32@kanto.co.jp
 Reference No : 16072
 Recommended use : For research use only
 Restrictions on use : Seek expert judgment when using the product for applications other than those recommended.

2. Hazards identification

GHS classification

Physical hazards	Flammable liquids	Category 1
Health hazards	Acute toxicity (inhalation:vapors)	Category 3
	Carcinogenicity	Category 2
	Specific target organ toxicity (single exposure)	Category 1 (respiratory organs)
	Specific target organ toxicity (repeated exposure)	Category 1 (liver)
Environmental hazards	Aquatic acute	Category 3

Hazard
pictograms



Signal word : Danger

Hazard statements : Extremely flammable liquid and vapor
 Toxic if inhaled
 Suspected of causing cancer
 Causes damage to organs (respiratory organs)
 Causes damage to organs (liver) through prolonged or repeated exposure
 Harmful to aquatic life

Precautionary statements

Prevention : Do not handle until all safety precautions have been read and understood.
 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.



Kanto Chemical Co., Inc.

	Use explosion-proof electrical/ventilating/lighting equipment. Use only non-sparking tools. Take action to prevent static discharges. Do not breathe mist/vapors. Wash hands, forearms and face thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection.
Response	: IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water . IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF exposed or concerned: Call a POISON CENTER or doctor. IF exposed or concerned: Get medical advice/attention. Call a POISON CENTER or doctor. Get medical advice/attention if you feel unwell.
Storage	: Store in a well-ventilated place. Keep container tightly closed. Store in a well-ventilated place. Keep cool. Store locked up.
Disposal	: Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

3. Composition/information on ingredients

Distinction of substance or mixture : Substance

Chemical name	Concentration (%)	Formula	TSCA	EC-No.	CAS RN
Furan	≥ 99	C ₄ H ₄ O	Listed	203-727-3	110-00-9

4. First aid measures

First aid measures

First-aid measures after inhalation	: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately get medical treatment.
First-aid measures after skin contact	: Wash the affected areas under running water.
First-aid measures after eye contact	: Wash the affected areas under running water.
First-aid measures after ingestion	: The chemical is volatile. Do not induce vomiting because it increases the risk of aspiration into the lungs. Get medical attention immediately. If necessary, rinse mouth with water.
Personal Protection in First Aid and Measures	: Rescuers should wear proper protective equipment like rubber gloves, goggles.

5. Fire fighting measures

Suitable extinguishing media	: Dry chemical, CO ₂ , dry sand, or alcohol-resistant foam
Unsuitable extinguishing media	: Water spray, Foam extinguisher
Firefighting instructions	: Move containers from fire area if it can be done without risk, if



not possible, apply water from a safe distance to cool and protect surrounding area.

Fight fire from windward.

Dry chemical powder, carbon dioxide or dry sand should be used for small fires. Alcohol-resistant foam extinguisher is effective for a large scale fire.

Personal protection (Emergency response) : Wear breathing apparatus.

6. Accidental release measures

Personal Precautions, Protective Equipment and Emergency Procedures

General measures : Wear proper protective equipment and avoid contact with skin and inhalation of vapor. Conduct operations from upwind and evacuate people downwind. Remove all sources of ignition. Keep away personnel except for authorized ones from spillage area by stretching ropes.

Environmental precautions

Environmental precautions : Attention should be given to avoid damage to the environment by flowing of spillage to rivers.

Methods and Equipment for Containment and Cleaning up

For containment : Absorb spill with inert material (e.g, diatomaceous earth, sand) and flush spillage area with copious amounts of water.

Prevention Measures for Secondary Accidents : Remove nearby sources of ignition and prepare extinguishing media.

7. Handling and storage

Handling

Technical measures : Wear proper protective equipment to avoid contact with skin or inhalation of vapor. Fire is strictly prohibited.

Ventilate well at working places.

Use explosion-proof electric apparatus.

Precautions for safe handling : Avoid formation of vapor and aerosols.

Do not allow contact with oxidizing substances.

Storage

Storage conditions : Store in a dark, cool place and tightly closed.

Material used in packaging/containers : Glass, fluorine resin, stainless steel.

Do not use polyvinyl chloride resin, polystyrene.

8. Exposure controls / Personal protection equipment

ACGIH TWA	Not established
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Appropriate engineering controls : Use with an enclosed system or a local exhaust ventilation.

Protective equipment

Respiratory protection : If necessary, wear chemical cartridge respirator with an organic vapor cartage

Hand protection : Impervious protective gloves



Eye protection : Safety goggles
Skin and body protection : Protective clothing, protective boots

9. Physical and chemical properties

Physical state : Liquid
Color : Colorless - pale yellow
Odor : Characteristic
pH : No data available
Melting point : -85.68 ° C
Freezing point : No data available
Boiling point : 31.36 ° C
Flash point : -35 ° C (C.C.)
Auto-ignition temperature : 390 ° C
Decomposition temperature : No data available
Flammability : Flammable
Vapor pressure : 658 hPa (20°C)
Relative density : No data available
Density : 0.936 - 0.941 g/cm³ (20°C)
Relative gas density : 2.3
Solubility : Water: 1 % (25°C)
Partition coefficient n-octanol/water (log Pow) : 1.34
Explosive limits (vol %) : 2.3 - 14.3 vol %
Viscosity, kinematic : 0.41 mm²/s (20°C)
Particle characteristics : No data available

10. Stability and reactivity

Reactivity : Substitution reactions and addition reactions are likely to occur at the 2-position and then the 5-position.
Since it contains a diene bond, a Diels-Alder reaction is carried out.
Chemical stability : Stable under normal conditions. Unstable peroxides are produced when exposed to air.
Possibility of hazardous reactions : May react violently when in contact with oxidizing substances.
Conditions to avoid : Light, heat.
Incompatible materials : Oxidizing substances.
Hazardous decomposition products : Carbon monoxide.

11. Toxicological information

Acute toxicity (oral) : Classification not possible
Acute toxicity (dermal) : Classification not possible
Acute toxicity (inhalation) : No classification (gas)
Toxic if inhaled (vapor)
rat LC50=1732ppm/4h
Classification not possible (dust, mist)



Skin corrosion/irritation	: Classification not possible Although there is a description, "skin irritation" in the study with guinea pig, this datum is not adopted, because examination of this cited literature contained a description, "Since Furan has strong volatility (boiling point: 32°C), irritation was not examined." In addition, there is a description, "primary irritation" in the dermal administration test with rabbits, but its details are unknown. Therefore, classification is not possible, because data are insufficient.
Serious eye damage/irritation	: Classification not possible Although there is a description of "Irritation and burns may be caused by contacting to eyes", the details are also unknown. Therefore, since data is insufficient, classification is not possible.
Respiratory sensitization	: Classification not possible Although it has been described that the influence on the immune system including an allergic reaction was indicated in the inhalation exposure tests employing rats, classification is not possible because of insufficient data.
Skin sensitization	: Classification not possible Although it has been described that the allergic reactions were observed in the skin painting study employing guinea pig, classification is not possible because of insufficient data.
Germ cell mutagenicity	: No classification (1) In vivo, intraperitoneally administered chromosome aberration tests using mouse and rat bone marrow cells were negative (rat) and positive (mouse), two micronucleus tests using mouse spleen cells were positive or showed a positive trend (non-significant), two micronucleus tests using mouse red blood cells were negative, and DNA repair tests using mouse and rat liver cells and DNA cleavage tests using mouse spleen cells were all negative. DNA repair test using mouse hepatocytes and DNA cleavage test using mouse splenocytes were all negative. (2) A gene mutation test using hepatocytes from genetically modified (Big Blue) mice was negative, and a gene mutation test using hepatocytes, lymphocytes (Hprt, Pig-A), and erythrocytes (Pig-A) from genetically modified (Big Blue) rats and a peripheral blood micronucleus test were all negative. In the liver comet assay, positive reactions were observed in the high-dose group (≥ 16 mg/kg/day). (3) In vitro, the bacterial reverse mutation assay was negative, the chromosomal aberration assay using CHO cells was positive (+S9) or negative (-S9), and the micronucleus assay using human lymphocytes or mouse lymphoma cells was negative. (4) The German DFG concluded that the positive result in the in vivo genotoxicity study of the substance was a secondary effect at very high doses and that the substance is a non-genotoxic carcinogen for which a threshold can be established and changed the MAK carcinogenicity category 2 to category 4. Based on the above, the substance was classified as "No classification".
Carcinogenicity	: Suspected of causing cancer IARC classifies it as group 2B (possibly carcinogenic to humans).
Reproductive toxicity	: Classification not possible



STOT-single exposure	: Causes damage to organs (respiratory organs) In a 1-hour single inhalation (vapor) exposure study in rats, it was reported that breathing difficulty, pulmonary edema, and increased secretion were observed at exposures of 1,014 to 4,049 ppm (2.82 to 11.3 mg/L, range of category 1 to 2). Based on the above, the substance was classified as category 1 (respiratory organs).
STOT-repeated exposure	: Causes damage to organs (liver) through prolonged or repeated exposure (1) In a 13-week forced oral administration study (5 days/week) using mice, the following liver histological changes (hepatocyte hypertrophy, degeneration, and necrosis, Kupffer cell pigmentation (greenish yellow to brown), bile duct hyperplasia, and bile duct fibrosis (females only)) were observed at doses of 8 mg/kg/day (90-day equivalent: 5.8 mg/kg/day: category 1) or higher in males and 15 mg/kg/day (90-day equivalent: 10.8 mg/kg/day: within category 2) or higher in females.), hypertrophy, degeneration, and necrosis of hepatocytes, pigmentation of Kupffer cells (greenish yellow to brown), bile duct hyperplasia, and bile duct fibrosis (females only)), and liver weight gain was observed in the two high-dose groups (males: 15 and 30 mg/kg/day, females: 30 and 60 mg/kg/day; range of category 2). (2) In a 13-week forced oral administration study (5 days/week) in rats, intrahepatic bile duct hyperplasia and fibrosis (except in females at 4 mg/kg/day) and intrahepatic bile duct hyperplasia and fibrosis at ≥ 4 mg/kg/day (90-day equivalent: 2.9 mg/kg/day, category 1) in both males and females at the lowest dose (90-day equivalent: 5.8 mg/kg/day) and at 8 or 15 mg/kg/day (90-day equivalent: 5.8 mg/kg/day) in females. .8 or 10.8 mg/kg/day, category 1 to 2 range) or higher, increased absolute and relative liver weight, and histological changes of hepatocytes (hypertrophy, degeneration, necrosis, nodular hyperplasia, Kupffer cell pigmentation (green to brown color), etc.) were observed. In addition, deaths (9/10 males and 4/10 females) were observed at 60 mg/kg/day (90-day equivalent: 43.2 mg/kg/day), and necrosis of renal tubular epithelium and atrophy of testes, ovaries and thymus were observed in many males and females, which were considered to be secondary changes due to weakness. (3) In a 2-year forced oral carcinogenicity study in rats and mice, liver effects (fibrosis of bile ducts, hyperplasia, chronic inflammation, hyperplasia, hyperplasia of bile ducts, hyperplasia of liver cells, hyperplasia of liver cells, vacuolization) were observed in all dose groups (rat: 2-8 mg/kg/day, mouse: 8, 15 mg/kg/day) from the category 1 range as nonneoplastic lesions in both rats and mice. hyperplasia, chronic inflammation, hyperplasia, hepatocyte hypertrophy, vacuolation, degeneration, and necrosis) were observed. Based on the above, the substance was classified as category 1 (liver).
Aspiration hazard	: Classification not possible

12. Ecological information

Ecotoxicity

Aquatic acute	: Harmful to aquatic life Pimephales promelas LC50=61 mg/L/96h
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Aquatic chronic : No classification
Pimephales promelas NOEC=36.3 mg/L/33-day

Persistence and degradability

Not readily biodegradable
BOD : 4%

Bioaccumulative potential

Low bioconcentration
BCF : 0.9-1.5 (1mg/L), ≤3.2-13 (0.1mg/L)

Mobility in soil

High mobility
Koc : 80

Hazardous to the ozone layer

Ozone : Classification not possible

13. Disposal considerations

Ecological waste information : Burn in a chemical incinerator equipped with an afterburner and a scrubber. Or entrust approved waste disposal companies with the disposal.

Contaminated container and packaging : In case of disposal of empty bottles, dispose bottles after removing the content thoroughly.

14. Transport information

International Regulations

Transport by sea(IMDG)

UN-No. (IMDG) : 2389
Proper Shipping Name (IMDG) : FURAN
Packing group (IMDG) : I
Transport hazard class(es) : 3

(IMDG)

Air transport(IATA)

UN-No. (IATA) : 2389
Proper Shipping Name (IATA) : Furan
Packing group (IATA) : I
Transport hazard class(es) : 3

(IATA)

Marine pollutant : Not applicable
MFAG-No : 128

15. Regulatory information

Regulatory information with regard to this substance in your country or region should be examined by your own responsibility.

16. Other information

Data sources : NITE Chemical Risk Information Platform (NITE-CHRIP), National Institute of Technology and Evaluation.
Solvents Handbook, T, Asahara el, Kodansha Scientific Ltd.
(1976) .
Handbook of Dangerous Substances Springer-Verlag Tokyo



(1991) .

The information contained herein is based on several references and the present state of our knowledge. However the SDS does not always cover all information about the product, handle the product carefully. The information is intended to ordinary usage, in case of particular handlings, conduct appropriate safety measurements. The information herein is only provision of information, and it does not represent a guarantee the properties of the product. The Safety Data Sheet (SDS) is prepared based on JIS Z7253.

