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# Safety Data Sheet

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

Product identifier:

Product name: Tetrahydrofuran

Product code(SDS NO): 48120jis_E1-2

Details of the supplier of the safety data sheet

Manufacturer/Supplier: JUNSEI CHEMICAL CO., LTD.
Address: 1-6, Ohmano-Cho, Koshigaya, Saitama 343-0844, Japan
Competent section: Quality Assurance Department
Telephone number: +81-48-986-6161
FAX: +81-48-989-2787
e-mail address: shiyaku-t@junsei.co.jp

## 2. Hazards identification

GHS classification and label elements of the product

Classification of the substance or mixture

PHYSICAL HAZARDS

Flammable liquids: Category 2

HEALTH HAZARDS

Acute toxicity Oral: Category 4

Skin corrosion/irritation: Category 2

Serious eye damage/eye irritation: Category 2A

Specific target organ toxicity - single exposure: Category 2

Specific target organ toxicity - single exposure: Respiratory tract irritation Category 3

Specific target organ toxicity - repeated exposure: Category 1

(Note) GHS classification without description: Not applicable/Out of classification/Not classifiable

Label elements

Signal word: Danger

HAZARD STATEMENT

Highly flammable liquid and vapor

Harmful if swallowed

Causes skin irritation

Causes serious eye irritation

May cause damage to organs after single exposure

May cause respiratory irritation

Causes damage to organs through prolonged or repeated exposure

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/eye protection/face protection.
Wear protective gloves and face protection.
Wear 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.
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 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.
Rinse mouth.
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

Storage

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

Disposal

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

Physical and Chemical hazards

Highly flammable liquid. Vapor/air mixture may explode.

## 3. Composition/information on ingredients

Substance/Mixture:

Substance

Ingredient name:Tetrahydrofuran
Content(%):99.0<
Chemical formula:C4H8O
Chemicals No, Japan:5-53
CAS No.:109-99-9
MW:72.11
ECNO:203-726-8

Impurities and stabilizing additives

Stabilizer(GR, EP):approx. 0.03% butylhydroxytoluene.

## 4. First-aid measures

Descriptions of first-aid measures

General measures

Get medical attention/advice if you feel unwell.
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.

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 skin irritation 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 foam, dry powder, CO2, dry sand, water in large amounts.

Specific hazards arising from the substance or mixture

Containers may explode when heated.

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

Runoff from fire control or dilution water may cause pollution.

Advice for firefighters

Specific fire-fighting measures

Evacuate non-essential personnel to safe area.

Cool container with water spray.

Special protective equipment and precautions for fire-fighters

Wear fire/flame resistant/retardant clothing.

Wear cold insulating gloves/face shield/eye protection.

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

## 6. Accidental release measures

Personnel precautions, protective equipment and emergency procedures

Ventilate area after material pick up is complete.

Wear proper protective equipment.

Environmental precautions

Avoid release to the rivers, lakes, ocean, groundwater.

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 & 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.

Avoid breathing dust, vapor, mist, or gas.

Safety Measures/Incompatibility

Use only outdoors or in a well-ventilated area.

Wear protective gloves, protective clothing or face protection.

Wear protective gloves and face protection.

Wear eye protection/face protection.

Use personal protective equipment as required.

When using do not eat, drink or smoke.

Conditions for safe storage, including any incompatibilities

Recommendation for storage

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

Keep cool. Protect from sunlight.

Store locked up.

8. Exposure controls/personal protection

Control parameters

Adopted value

ACGIH(2002) TWA: 50ppm

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

Notation･･･Skin

OSHA-PEL

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 positive pressure self-contained breathing apparatus (SCBA).

Hand protection

Wear protective gloves.

Eye protection

Wear eye/face protection.

Safety and Health measures

Wash ... thoroughly after handling.

Do not eat, drink or smoke when using this product.
Take off contaminated clothing and wash it before reuse.

## 9. Physical and Chemical Properties

Information on basic physical and chemical properties

Physical properties

Appearance: LIQUID
Color: COLOURLESS
Odor: CHARACTERISTIC ODOUR
pH data N.A.

Phase change temperature

Initial Boiling Point/Boiling point: 66℃
Melting point/Freezing point: −108.5℃
Decomposition temperature data N.A.
Flash point: (C.C.) −14.5℃
Auto-ignition temperature: 321℃
Explosive properties: Flammability or explosive limit
lower limit: 2.0 vol %
upper limit: 11.8 vol %
Vapor pressure: 19.3 kPa (20℃)
Vapor density data N.A.
Relative Vapor Density (Air=1): 2.5
Relative density of the Vapor/air-mixture at 20℃ (Air = 1): 1.28
Specific gravity/Density: 0.8892(20／4℃)
Solubility
Solubility in water: Miscible
Solubility in solvent: Very soluble in ethanol, diethyl ether.
n-Octanol /water partition coefficient: log Pow0.46

## 10. Stability and Reactivity

Chemical stability

Stable under normal storage/handling conditions.
Highly flammable.

Possibility of hazardous reactions

Vapors may ignite explosively.
May form explosive peroxides.
The vapour is heavier than air and may travel along the ground; distant ignition possible.
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.

Conditions to avoid

Contact with incompatible materials.
Open flames. Heat.

Incompatible materials

Strong bases, Strong oxidizing agents, Metal halides.

Hazardous decomposition products

Carbon oxides

## 11. Toxicological Information

Information on toxicological effects

Acute toxicity

Acute toxicity (Oral)
[GHS Cat. Japan, base data]
rat LD50=1851 mg/kg (cal.)
Acute toxicity (Inhalation)
[GHS Cat. Japan, base data]
vapor; rat LC50=21000ppm/3hr[equivalent 61.95mg/L/3hr] (CERI Hazard Data, 1999)
Irritant properties
Skin corrosion/irritation
[GHS Cat. Japan, base data]
human:irritating (CERI Hazard Data, 1999 et al)
Serious eye damage /irritation
[GHS Cat. Japan, base data]
human:irritating (CERI Hazard Data, 1999 et al)
No Allergenic and sensitizing effects data available
Mutagenic effects
Chromosome aberration test :Negative (mouse bone marrow cells (in vivo); CERI Hazard Data, 1999)
No Teratogenic effects data available
Carcinogenicity
ACGIH-A3(2002) : Confirmed Animal Carcinogen with Unknown Relevance to Humans
EU-Category 2; Substances suspected human carcinogens
EPA(2005); Suggestive evidence of carcinogenic potential
No reproductive toxicity data available
Delayed and immediate effects and also chronic effects from short- and long-term exposure
STOT
STOT-single exposure
[cat.2]
[Japan published data]
nerve/nervous system ( CERI hazard data book, 1999 )
[cat.3(resp. irrit.)]
[Japan published data]
Respiratory tract irritation ( HSDB, 2005 )
STOT-repeated exposure
[cat.1]
[Japan published data]
liver; kidney; nerve/nervous system ( ACGIH, 2001 )
No Aspiration hazard data available

## 12. Ecological Information

Toxicity
Aquatic toxicity
Aquatic acute toxicity component(s) data
[GHS Cat. Japan, base data]
Fish(fat head minnow) LC50=2160 mg/L/96hr (CERI Hazard Data, 2000 et al.)
Water solubility
miscible (ICSC, 1997)
Persistence and degradability
BOD_Degradation : 100% (Registered chemicals data check & review, Japan)
Bioaccumulative potential
log Pow=0.46 (HSDB)

## 13. Disposal considerations

Waste treatment methods

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

## 14. Transport Information

UN No, UN CLASS

UN number: 2056

UN proper shipping name:TETRAHYDROFURAN

Transport hazard class(es): 3

Packing group: II

ERG GUIDE NO.: 127

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

Noxious Liquid ; Cat. Z

Tetrahydrofuran

## 15. Regulatory Information

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

US major regulations

TSCA

Tetrahydrofuran

Other regulatory information

We are not able to check up the regulatory information in regard to the substances in your country or region, therefore, we request this matter would be filled by your responsibility. Regulatory information with regard to this substance in your country or in your region should be examined by your own responsibility.

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

Skin Irrit. 2: H315 Causes skin irritation

Eye Irrit. 2A: H319 Causes serious eye irritation

STOT SE 2: H371 May cause damage to organs after single exposure

STOT SE 3: H335 May cause respiratory irritation

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

Reference Book

Globally Harmonized System of classification and labelling of chemicals, (5th ed., 2013), UN Recommendations on the TRANSPORT OF DANGEROUS GOODS 18th edit., 2013 UN Classification, labelling and packaging of substances and mixtures (table3-1 ECNO6182012)

2012 EMERGENCY RESPONSE GUIDEBOOK(US DOT)

2014 TLVs and BEIs. (ACGIH)

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

Supplier's data/information

Chemical Risk Information Platform (CHRIP)(NITE) http://www.safe.nite.go.jp/japan/db.html

GHS Classification Guidance for Enterprises 2013 Revised Edition (August, 2013,METI)

Other information

This information contained in this data sheet represents the best information currently available to us. However, no warranty is made with respect to its completeness and we assume no liability resulting from its use. It are advised to make their own tests to determinate the safety and suitability of each such product or combination for their own purposes.

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.