

# SAFETY DATA SHEET

According to JIS Z 7253:2019  
**Revision date** 26-Feb-2024  
 Revision Number 1.06

## Section 1: PRODUCT AND COMPANY IDENTIFICATION

<b>Product Name</b>	Oxidizing Solution-2
<b>Product Code</b>	156-02451,152-02453,150-02459,154-02457

**Supplier** FUJIFILM Wako Pure Chemical Corporation  
 1-2 Doshomachi 3-Chome, Chuo-ku, Osaka 540-8605, Japan  
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**Emergency telephone number** +81-6-6203-3741 / +81-3-3270-8571

**Recommended uses** For research use only

**Restrictions on use** Seek expert judgment when using for purposes other than those recommended.

## Section 2: HAZARDS IDENTIFICATION

**GHS classification**

**Classification of the substance or mixture**

<b>Flammable liquids</b>	Category 2
<b>Acute toxicity - Oral</b>	Category 4
<b>Acute toxicity - Inhalation (Vapors)</b>	Category 3
<b>Skin corrosion/irritation</b>	Category 1
<b>Serious eye damage/eye irritation</b>	Category 1
<b>Skin sensitization</b>	Category 1
<b>Carcinogenicity</b>	Category 2
<b>Reproductive Toxicity</b>	Category 2
<b>Specific target organ toxicity (single exposure)</b>	Category 1, Category 3
<b>Category 1</b> central nervous system, respiratory system, nervous system	
<b>Category 3</b> Respiratory irritation, Narcotic effects	
<b>Specific target organ toxicity (repeated exposure)</b>	Category 1
<b>Category 1</b> central nervous system, respiratory system, liver, kidneys, nervous system	
<b>Acute aquatic toxicity</b>	Category 1
<b>Chronic aquatic toxicity</b>	Category 2

**Pictograms**



**Signal word** Danger

**Hazard statements**

- H225 - Highly flammable liquid and vapor
- H314 - Causes severe skin burns and eye damage
- H318 - Causes serious eye damage
- H302 - Harmful if swallowed
- H331 - Toxic if inhaled
- H351 - Suspected of causing cancer
- H361 - Suspected of damaging fertility or the unborn child
- H335 - May cause respiratory irritation

H336 - May cause drowsiness or dizziness  
 H317 - May cause an allergic skin reaction  
 H411 - Toxic to aquatic life with long lasting effects  
 H400 - Very toxic to aquatic life  
 H370 - Causes damage to the following organs: central nervous system, respiratory system, nervous system  
 H372 - Causes damage to the following organs through prolonged or repeated exposure: central nervous system, respiratory system, liver, kidneys, nervous system

**Precautionary statements-(Prevention)**

- Obtain special instructions before use
- Do not handle until all safety precautions have been read and understood
- Use personal protective equipment as required
- Contaminated work clothing should not be allowed out of the workplace
- Wear protective gloves
- Do not breathe dust/fume/gas/mist/vapors/spray
- Wash face, hands and any exposed skin 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
- Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. 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
- Keep cool

**Precautionary statements-(Response)**

- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
- Immediately call a POISON CENTER or doctor/physician
- If skin irritation or rash occurs: Get medical advice/attention
- Wash contaminated clothing before reuse
- IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
- Call a POISON CENTER or doctor/physician if you feel unwell
- IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
- Rinse mouth
- Do NOT induce vomiting
- In case of fire: Use suitable extinguishing media for extinction
- Collect spillage

**Precautionary statements-(Storage)**

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

**Precautionary statements-(Disposal)**

- Dispose of contents/container to an approved waste disposal plant

**Others**

**Other hazards** Not available

**Section 3: COMPOSITION/INFORMATION ON INGREDIENTS**

**Single Substance or Mixture** Mixture

Chemical Name	Weight-%	Molecular weight	ENCS	ISHL No.	CAS RN
Tetrahydrofuran	76.0 - 80.0	72.11	(5)-53	*	109-99-9
Pyridine	19.0 - 21.0	79.10	(5)-710	*	110-86-1
Iodine	2.8	253.81	-	N/A	7553-56-2
Water	1.8 - 2.2	18.02	-	N/A	7732-18-5

**Note on ISHL No.:** \* in the table means announced chemical substances.

**Impurities and/or Additives:** [Stabilizer]2,6-Di-t-butyl-4-methylphenol (BHT) about 0.02 %

## Section 4: FIRST AID MEASURES

### Inhalation

Remove to fresh air. If symptoms persist, call a physician.

### Skin contact

Wash off immediately with soap and plenty of water. If symptoms persist, call a physician.

### Eye contact

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediate medical attention is required.

### Ingestion

Rinse mouth. Never give anything by mouth to an unconscious person. Call a physician or poison control center immediately. Do not induce vomiting without medical advice.

### Protection of first-aiders

Use personal protective equipment as required.

## Section 5: FIRE FIGHTING MEASURES

### Suitable extinguishing media

Carbon dioxide (CO<sub>2</sub>), Foam, Extinguishing powder, Sand

### Unsuitable extinguishing media

No information available

### Specific hazards arising from the chemical product

Vapors may form explosive mixture with air Thermal decomposition can lead to release of irritating and toxic gases and vapors. Vapors may form explosive mixtures with air

### Special extinguishing method

No information available

### Special protective actions for fire-fighters

Use personal protective equipment as required. Firefighters should wear self-contained breathing apparatus and full firefighting turnout gear.

## Section 6: ACCIDENTAL RELEASE MEASURES

### Personal precautions, protective equipment and emergency procedures

For indoor, provide adequate ventilation process until the end of working. Deny unnecessary entry other than the people involved by, for example, using a rope. While working, wear appropriate protective equipments to avoid adhering it on skin, or inhaling the gas. Work from windward, and retract the people downwind.

### Environmental precautions

To be careful not discharged to the environment without being properly handled waste water contaminated.

### Methods and materials for contaminant and methods and materials for cleaning up

Absorb dry sand, earth, sawdust and the waste. Collect empty container that can be sealed.

### Recovery, neutralization

No information available

### Secondary disaster prevention measures

Clean contaminated objects and areas thoroughly observing environmental regulations.

## Section 7: HANDLING AND STORAGE

### Handling

#### Technical measures

Highly flammable. Avoid contact with high temperature objects, spark, and strong oxidizing agents. Use with local exhaust ventilation.

#### Precautions

Do not rough handling containers, such as upsetting, falling, giving a shock, and dragging. Prevent leakage, overflow, and scattering. Not to generate steam and dust in vain. Seal the container after use. After handling, wash hands and face, and then gargle. In places other than those specified, should not be smoking or eating and drinking. Should not be brought contaminated protective equipment and gloves to rest stops. Deny unnecessary entry of non-emergency personnel to the handling area.

**Safety handling precautions**

Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapors). Use personal protective equipment as required. Avoid contact with skin, eyes or clothing.

**Storage****Safe storage conditions****Storage conditions**

Keep container protect from light, store in well-ventilated place at room temperature (preferably cool). Keep container tightly closed.

**Safe packaging material**

Glass

**Incompatible substances**

Strong oxidizing agents

## Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

**Engineering controls**

In case of indoor workplace, seal the source or use a local exhaust system. Provide the safety shower facility, and hand- and eye-wash facility. And display their position clearly.

**Exposure limits**

Chemical Name	JSOH (Japan)	ISHL (Japan)	ACGIH
Tetrahydrofuran 109-99-9	TWA: 50 ppm OEL TWA: 148 mg/m <sup>3</sup> OEL Skin ISHL/ACL: 50 ppm	ISHL/ACL: 50 ppm	STEL: 100 ppm TWA: 50 ppm Skin
Pyridine 110-86-1	N/A	N/A	TWA: 1 ppm
Iodine 7553-56-2	TWA: 0.1 ppm OEL TWA: 1 mg/m <sup>3</sup> OEL	N/A	STEL: 0.1 ppm vapor fraction TWA: 0.001 ppm I inhalable fraction and vapor Skin

Chemical Name	Concentration standard value set by the Minister of Health, Labor and Welfare (8hr)	Concentration standard value set by the Minister of Health, Labor and Welfare (Short-Term)
Pyridine 110-86-1	1 ppm	N/A
2,6-Di(tert-butyl)-4-methylphenol 128-37-0	10 mg/m <sup>3</sup>	N/A

**Personal protective equipment****Respiratory protection**

gas mask for organic gas ( JIS T 8152 )

**Hand protection**

chemical protective gloves ( JIS T 8116 )

**Eye protection**

protective eyeglasses or chemical safety goggles (JIS T 8147)

**Skin and body protection**

Long-sleeved work clothes

**General hygiene considerations**

Handle in accordance with good industrial hygiene and safety practice.

If this product is classified as "Chemical Substances Hazardous to Skin, etc.", use appropriate protective equipment to them.

## Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Data except for the appearance is described as a solvent (Tetrahydrofuran).

<b>Form</b>	
<b>Color</b>	brown
<b>Appearance</b>	liquid
<b>Odor</b>	characteristic odor
<b>Melting point/freezing point</b>	-108.5 °C
<b>Boiling point, initial boiling point and boiling range</b>	65 °C
<b>Flammability</b>	Highly flammable liquid and vapor
<b>Evaporation rate:</b>	no data available
<b>Flammability (solid, gas):</b>	no data available
<b>Upper/lower flammability or explosive limits</b>	
<b>Upper:</b>	11.8%
<b>Lower:</b>	2.0%
<b>Flash point</b>	-19 °C
<b>Auto-ignition temperature:</b>	321 °C
<b>Decomposition temperature:</b>	no data available
<b>pH</b>	no data available
<b>Viscosity (coefficient of viscosity)</b>	no data available
<b>Dynamic viscosity</b>	no data available
<b>Solubilities</b>	water , Ethanol , ether : freely soluble .
<b>n-Octanol/water partition coefficient:(log Pow)</b>	no data available
<b>Vapour pressure</b>	no data available
<b>Specific Gravity / Relative density</b>	0.888
<b>Vapour density</b>	2.5(air=1)
<b>Particle characteristics</b>	no data available

## Section 10: STABILITY AND REACTIVITY

### Stability

<b>Reactivity</b>	no data available
<b>Chemical stability</b>	May be altered by light.

### Hazardous reactions

None under normal processing

### Conditions to avoid

Extremes of temperature and direct sunlight, Heat, flames and sparks, static electricity, spark

### Incompatible materials

Strong oxidizing agents

### Hazardous decomposition products

Nitrogen oxides (NOx), Halides, Carbon monoxide (CO), Carbon dioxide (CO<sub>2</sub>)

## Section 11: TOXICOLOGICAL INFORMATION

### Acute toxicity

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Tetrahydrofuran	2000 mg/kg ( Rat )	N/A	18187 ppm ( Rat ) 4 h
Pyridine	891 mg/kg ( Rat )	1120 mg/kg ( Rabbit )	4637 ppm - 5564 ppm ( Rat ) 4 h
Iodine	315 mg/kg ( Rat )	3,333 mg/kg ( Rat )	35 ppm ( Rat ) 4 h

Chemical Name	Acute toxicity -oral- source information	Acute toxicity -dermal- source information	Acute toxicity -inhalation gas-source information
Tetrahydrofuran	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Pyridine	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Iodine	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.

Chemical Name	Acute toxicity -inhalation	Acute toxicity -inhalation dust-	Acute toxicity -inhalation mist-
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	vapor- source information	source information	source information
Tetrahydrofuran	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Pyridine	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Iodine	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.

**Skin irritation/corrosion**

Chemical Name	Skin corrosion/irritation source information
Tetrahydrofuran	Based on the NITE GHS classification results.
Pyridine	Based on the NITE GHS classification results.
Iodine	Based on the NITE GHS classification results.

**Serious eye damage/ irritation**

Chemical Name	Serious eye damage/irritation source information
Tetrahydrofuran	Based on the NITE GHS classification results.
Pyridine	Based on the NITE GHS classification results.
Iodine	Based on the NITE GHS classification results.

**Respiratory or skin sensitization**

Chemical Name	Respiratory or Skin sensitization source information
Tetrahydrofuran	Based on the NITE GHS classification results.
Pyridine	Based on the NITE GHS classification results.
Iodine	Based on the NITE GHS classification results.

**Reproductive cell mutagenicity**

Chemical Name	germ cell mutagenicity source information
Tetrahydrofuran	Based on the NITE GHS classification results.
Pyridine	Based on the NITE GHS classification results.
Iodine	Based on the NITE GHS classification results.

**Carcinogenicity**

Chemical Name	Carcinogenicity source information
Tetrahydrofuran	Based on the NITE GHS classification results.
Pyridine	Based on the NITE GHS classification results.
Iodine	Based on the NITE GHS classification results.

Chemical Name	NTP	IARC	ACGIH	JSOH (Japan)
Tetrahydrofuran 109-99-9	-	-	A3	-
Pyridine 110-86-1	-	Group 2B	A3	-

**Reproductive toxicity**

Chemical Name	Reproductive toxicity source information
Tetrahydrofuran	Based on the NITE GHS classification results.
Pyridine	Based on the NITE GHS classification results.
Iodine	Based on the NITE GHS classification results.

**STOT-single exposure**

Chemical Name	STOT -single exposure- source information
Tetrahydrofuran	Based on the NITE GHS classification results.
Pyridine	Based on the NITE GHS classification results.
Iodine	Based on the NITE GHS classification results.

**STOT-repeated exposure**

Chemical Name	STOT -repeated exposure- source information
Tetrahydrofuran	Based on the NITE GHS classification results.
Pyridine	Based on the NITE GHS classification results.
Iodine	Based on the NITE GHS classification results.

**Aspiration hazard**

Chemical Name	Aspiration Hazard source information
Tetrahydrofuran	Based on the NITE GHS classification results.
Pyridine	Based on the NITE GHS classification results.
Iodine	Based on the NITE GHS classification results.

## Section 12: ECOLOGICAL INFORMATION

### Ecotoxicity

Chemical Name	Algae/aquatic plants	Fish	Crustacea
Tetrahydrofuran	LC50 : <i>Pimephales Promelas</i> 2160 mg/L 96 h	LC50 : <i>Fathead minnow</i> 2160 mg/L 96 h	EC50 : <i>Daphnia magna</i> 5930 mg/L 48 h
Pyridine	ErC50 : <i>Selenastrum capricornutum</i> 0.10 mg/L 72 h	LC50 : <i>Oncorhynchus mykiss</i> 4.6 mg/L 96 h	EC50 : <i>Daphnia magna</i> 520 mg/L 24 h
Iodine	N/A	N/A	LC50 : <i>Daphnia magna</i> 0.16 mg/L 48 h

### Other data

Chemical Name	Short-term (acute) hazardous to the aquatic environment source information	Long-term (chronic) hazardous to the aquatic environment source information
Tetrahydrofuran	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Pyridine	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Iodine	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.

<b>Persistence and degradability</b>	No information available
<b>Bioaccumulative potential</b>	No information available
<b>Mobility in soil</b>	No information available
<b>Hazard to the ozone layer</b>	No information available

## Section 13: DISPOSAL CONSIDERATIONS

### Waste from residues

Disposal should be in accordance with applicable regional, national and local laws and regulations.

### Contaminated container and contaminated packaging

Disposal should be in accordance with applicable regional, national and local laws and regulations.

## Section 14: TRANSPORT INFORMATION

### ADR/RID

<b>UN number</b>	UN2924
<b>Proper shipping name:</b>	Flammable liquid, corrosive, n.o.s. (Tetrahydrofuran)
<b>UN classification</b>	3
<b>Subsidiary hazard class</b>	8
<b>Packing group</b>	II
<b>Marine pollutant</b>	Yes

### IMDG

<b>UN number</b>	UN2924
<b>Proper shipping name:</b>	Flammable liquid, corrosive, n.o.s. (Tetrahydrofuran)
<b>UN classification</b>	3
<b>Subsidiary hazard class</b>	8
<b>Packing group</b>	II
<b>Marine pollutant (Sea)</b>	Yes
<b>Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code</b>	No information available

## IATA

UN number	UN2924
Proper shipping name:	Flammable liquid, corrosive, n.o.s. (Tetrahydrofuran)
UN classification	3
Subsidiary hazard class	8
Packing group	II
Environmentally Hazardous Substance	Yes

### Section 15: REGULATORY INFORMATION

Japanese regulations

<b>Fire Service Act</b>	Category IV, Class I petroleums, dangerous grade 2 water-soluble
<b>Poisonous and Deleterious Substances Control Law</b>	Not applicable
<b>Industrial Safety and Health Act</b>	Harmful Substances Whose Names Are to be Indicated on the Label (Law Art.57) Notifiable Substances (Law Art.57-2) Class 2 Organic Solvents (Enforcement Order Attached Table No.6-2, Ordinance on Prevention of Organic Solvent Poisoning Art.1, Para.1, Item 5) Dangerous Substances - Flammable Substance (Enforcement Order Attached Table 1 Item 4) Working Environment Evaluation Standards, Administrative Control Levels (Law Art.65-2, Para.1)
<b>Industrial Safety and Health Act (2024-)</b>	<b>【2024.4.1~】</b> Chemical Substances Hazardous to Skin, etc.(Regulations Article 594-2 Paragraph 1)
<b>Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc</b>	Priority Assessment Chemical Substances (Law Article 2, Para.5)
<b>Regulations for the carriage and storage of dangerous goods in ship</b>	Flammable Liquids (Ordinance Art.3, Ministry of Transportation Ordinance Regarding Transport by Ship and Storage, Attached Table 1)
<b>Civil Aeronautics Law</b>	Flammable Liquids (Ordinance Art.194, MITL Notification for Air Transportation of Explosives etc., Attached Table 1)
<b>Marine Pollution Prevention Law</b>	Enforcement ordinance Appendix No. 1 Noxious liquid substance Category Y Enforcement ordinance Appendix No. 1 Noxious liquid substance Category Z
<b>Pollutant Release and Transfer Register Law (2023.4.1-)</b>	Class 1
<b>Class 1 - No.</b>	342,674
<b>Export Trade Control Order</b>	Not applicable
<b>Air Pollution Control Law</b>	Specified Substances, Hazardous Air Pollutants

Chemical Name	Poisonous and Deleterious Substances Control Law	Industrial Safety and Health Act Substances (Law Art.57-2)	Pollutant Release and Transfer Register Law (2023.4.1-)
Tetrahydrofuran 109-99-9 ( 76.0 - 80.0 )	-	Applicable	Applicable
Pyridine 110-86-1 ( 19.0 - 21.0 )	-	Applicable	Applicable
Iodine 7553-56-2 ( 2.8 )	-	Applicable	-

### Section 16: OTHER INFORMATION

**Key literature references and sources for data etc.**

NITE: National Institute of Technology and Evaluation (JAPAN)  
<http://www.safe.nite.go.jp/japan/db.html>  
 IATA dangerous Goods Regulations



RTECS:Registry of Toxic Effects of Chemical Substances  
Japan Industrial Safety and Health Association GHS Model SDS  
Dictionary of Synthetic Organic Chemistry , SSOCJ, Koudansha Scientific Co.Ltd.  
Chemical Dictionary, Kyouritsu Publishing Co., Ltd.  
etc

**Record of SDS revisions**

The following contents were revised. Regulatory information.

**Disclaimer**

This SDS is according to JIS Z 7253: 2019. The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

GHS Classification is according to JIS Z 7252:2019. \*JIS: Japanese Industrial Standards

**End of Safety Data Sheet**