

SAFETY DATA SHEET

According to JIS Z 7253:2019
Revision date 22-Feb-2024
 Revision Number 3.05

Section 1: PRODUCT AND COMPANY IDENTIFICATION

| | |
|---------------------|---------------------|
| Product Name | Crotonaldehyde |
| Product Code | 039-07033,033-07036 |

| | |
|-----------------------------------|---|
| Supplier | FUJIFILM Wako Pure Chemical Corporation 1-2 Doshomachi 3-Chome, Chuo-ku, Osaka 540-8605, Japan Phone: +81-6-6203-3741 Fax: +81-6-6203-2029 |
| 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****Self-reactive substances and mixtures****Flammable liquids****Germ cell mutagenicity****Carcinogenicity****Acute aquatic toxicity**

Type G

Category 2

Category 1B

Category 1B

Category 2

Pictograms**Signal word**

Danger

Hazard statements

- H225 - Highly flammable liquid and vapor
- H340 - May cause genetic defects
- H350 - May cause cancer
- H401 - Toxic to aquatic life

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
- 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

Precautionary statements-(Response)

- IF exposed or concerned: Get medical advice/attention

- IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
- In case of fire: Use suitable extinguishing media for extinction

Precautionary statements-(Storage)

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

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 Substance

Formula CH₃CH:CHCHO

| Chemical Name | Weight-% | Molecular weight | ENCS | ISHL No. | CAS RN |
|----------------|----------|------------------|---------|----------|----------|
| (2E)-2-Butenal | 99.0 | 70.09 | (2)-524 | * | 123-73-9 |

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

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 (CO₂), Foam, Extinguishing powder, Sand

Unsuitable extinguishing media

No information available

Specific hazards arising from the chemical product

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. Packed with an inert gas. Store locked up.

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

This product, as supplied, does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies.

| 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) |
|----------------------------|---|--|
| (2E)-2-Butenal 123-73-9 | N/A | 0.3 ppm |

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

Form**Color**

Colorless - slightly yellow

Turbidity

clear

Appearance

liquid

Odor

characteristic odor

Melting point/freezing point

-76 °C

Boiling point, initial boiling point and boiling range

105 °C

Flammability

Highly flammable liquid and vapor

Evaporation rate:

no data available

Flammability (solid, gas):

no data available

Upper/lower flammability or explosive limits**Upper:**

15.5 %

Lower:

2.1 %

Flash point

13 °C

Auto-ignition temperature:

no data available

Decomposition temperature:

no data available

pH

no data available

Viscosity (coefficient of viscosity)

no data available

Dynamic viscosity

no data available

Solubilities

water , Ethanol , acetone : freely soluble .

n-Octanol/water partition coefficient:(log Pow)

0.63

Vapour pressure

4.93 kPa

Specific Gravity / Relative density

0.847 - 0.857 g/mL (20 °C)

Vapour density

2.41 (air = 1)

Particle characteristics

no data available

Section 10: STABILITY AND REACTIVITY

Stability**Reactivity**

no data available

Chemical stability

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 productsCarbon monoxide (CO), Carbon dioxide (CO₂)

Section 11: TOXICOLOGICAL INFORMATION

Acute toxicity

| Chemical Name | Oral LD50 | Dermal LD50 | Inhalation LC50 |
|----------------|-------------------------|----------------------------|--------------------------|
| (2E)-2-Butenal | 174 ~ 300 mg/kg (Rat) | 128 ~ 324 mg/kg (Rabbit) | 69 ~ 120 ppm (Rat) 4 h |

| Chemical Name | Acute toxicity -oral- source information | Acute toxicity -dermal- source information | Acute toxicity -inhalation gas- source information |
|----------------|---|---|--|
| (2E)-2-Butenal | 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 vapor- source information | Acute toxicity -inhalation dust- source information | Acute toxicity -inhalation mist- source information |
|----------------|--|---|---|
| (2E)-2-Butenal | 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 |
|----------------|---|
| (2E)-2-Butenal | Based on the NITE GHS classification results. |

Serious eye damage/ irritation

| Chemical Name | Serious eye damage/irritation source information |
|----------------|--|
| (2E)-2-Butenal | Based on the NITE GHS classification results. |

Respiratory or skin sensitization

| Chemical Name | Respiratory or Skin sensitization source information |
|----------------|--|
| (2E)-2-Butenal | Based on the NITE GHS classification results. |

Reproductive cell mutagenicity

| Chemical Name | germ cell mutagenicity source information |
|----------------|---|
| (2E)-2-Butenal | Based on the NITE GHS classification results. |

Carcinogenicity

| Chemical Name | Carcinogenicity source information |
|----------------|---|
| (2E)-2-Butenal | Based on the NITE GHS classification results. |

| Chemical Name | NTP | IARC | ACGIH | JSOH (Japan) |
|----------------------------|-----|---------|-------|--------------|
| (2E)-2-Butenal 123-73-9 | | Group 3 | | |

Reproductive toxicity

| Chemical Name | Reproductive toxicity source information |
|----------------|---|
| (2E)-2-Butenal | Based on the NITE GHS classification results. |

STOT-single exposure

| Chemical Name | STOT -single exposure- source information |
|----------------|---|
| (2E)-2-Butenal | Based on the NITE GHS classification results. |

STOT-repeated exposure

| Chemical Name | STOT -repeated exposure- source information |
|----------------|---|
| (2E)-2-Butenal | Based on the NITE GHS classification results. |

Aspiration hazard

| Chemical Name | Aspiration Hazard source information |
|----------------|---|
| (2E)-2-Butenal | Based on the NITE GHS classification results. |

Section 12: ECOLOGICAL INFORMATION

Ecotoxicity

| Chemical Name | Algae/aquatic plants | Fish | Crustacea |
|----------------|----------------------|--|-----------|
| (2E)-2-Butenal | N/A | LC50 : <i>Menidia beryllina</i> 1.3 mg/L 96 h | N/A |

Other data

| Chemical Name | Short-term (acute) hazardous to the aquatic environment source information | Long-term (chronic) hazardous to the aquatic environment source information |
|----------------|--|---|
| (2E)-2-Butenal | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. |

| | |
|--------------------------------------|----------------------------|
| Persistence and degradability | No information available |
| Bioaccumulative potential | No information available |
| Mobility in soil | No information available |
| Hazard to the ozone layer | No information available |
| Other Data | Very toxic to aquatic life |

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

| | |
|-------------------------|----------------|
| UN number | UN1143 |
| Proper shipping name: | Crotonaldehyde |
| UN classification | 6.1 |
| Subsidiary hazard class | 3 |
| Packing group | I |
| Marine pollutant | Yes |

IMDG

| | |
|--|--------------------------|
| UN number | UN1143 |
| Proper shipping name: | Crotonaldehyde |
| UN classification | 6.1 |
| Subsidiary hazard class | 3 |
| Packing group | I |
| Marine pollutant (Sea) | Yes |
| Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code | No information available |

IATA

| | |
|-------------------------------------|----------------|
| UN number | UN1143 |
| Proper shipping name: | Crotonaldehyde |
| UN classification | 6.1 |
| Subsidiary hazard class | 3 |
| Packing group | |
| Environmentally Hazardous Substance | Yes |

Section 15: REGULATORY INFORMATION

Japanese regulations

| | |
|--|---|
| Fire Service Act | Category IV, Class I petroleums, dangerous grade 2 |
| Poisonous and Deleterious Substances Control Law | Poisonous Substances 2nd. Grade |
| Industrial Safety and Health Act | Harmful Substances Whose Names Are to be Indicated on the Label (Law Art.57) Notifiable Substances (Law Art.57-2) Mutagens - Existing Chemicals Substances with Health Hazards Prevention Guideline(Carcinogenicity Substance) Dangerous Substances - Flammable Substance (Enforcement Order Attached Table 1 Item 4) |
| Industrial Safety and Health Act (2024-) | 【2024.4.1~】 Chemical Substances Hazardous to Skin, etc.(Regulations Article 594-2 Paragraph 1) |
| Regulations for the carriage and storage of dangerous goods in ship | Toxic Substances - Poison (Ordinance Art.3, Ministry of Transportation Ordinance Regarding Transport by Ship and Storage, Attached Table 1) |
| Civil Aeronautics Law | Forbidden (Ordinance Art.194) |
| Marine Pollution Prevention Law | Enforcement ordinance Appendix No. 1 Noxious liquid substance Category Y Marine pollutants (P and PP substances) |
| Pollutant Release and Transfer Register Law (2023.4.1-) | Class 1 |

Class 1 - No. 375
Export Trade Control Order Not applicable
Air Pollution Control Law 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-) |
|-------------------------------------|--|--|---|
| (2E)-2-Butenal 123-73-9 (99.0) | Applicable | Applicable | 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 Disclaimer

The following contents were revised. Regulatory information.

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