

## SAFETY DATA SHEET

According to JIS Z 7253:2019  
**Revision date** 28-Feb-2024  
 Revision Number 4.06

## Section 1: PRODUCT AND COMPANY IDENTIFICATION

|                     |   |
|---------------------|---|
| <b>Product Name</b> | Trinitratonitrosylruthenium(II) Nitric Acid Solution(abt.50%) |
| <b>Product Code</b> | 323-41561,321-41562   |

|                                   |   |
|-----------------------------------|---|
| <b>Supplier</b>                   | FUJIFILM Wako Pure Chemical Corporation<br>1-2 Doshomachi 3-Chome, Chuo-ku, Osaka 540-8605, Japan<br>Phone: +81-6-6203-3741<br>Fax: +81-6-6203-2029 |
| <b>Emergency telephone number</b> | +81-6-6203-3741 / +81-3-3270-8571   |
| <b>Recommended uses</b>           | For research use only   |
| <b>Restrictions on use</b>        | Seek expert judgment when using for purposes other than those recommended.  |

## Section 2: HAZARDS IDENTIFICATION

## GHS classification

## Classification of the substance or mixture

|   |            |
|---|------------|
| <b>Corrosive to metals</b>                                | Category 1 |
| <b>Acute toxicity - Inhalation (Vapors)</b>               | Category 2 |
| <b>Skin corrosion/irritation</b>                          | Category 1 |
| <b>Serious eye damage/eye irritation</b>                  | Category 1 |
| <b>Specific target organ toxicity (single exposure)</b>   | Category 1 |
| <b>Category 1</b> respiratory system                      |            |
| <b>Specific target organ toxicity (repeated exposure)</b> | Category 1 |
| <b>Category 1</b> respiratory system, teeth               |            |
| <b>Aspiration hazard</b>                                  | Category 1 |

## Pictograms



Signal word

Danger

## Hazard statements

- H290 - May be corrosive to metals
- H314 - Causes severe skin burns and eye damage
- H318 - Causes serious eye damage
- H330 - Fatal if inhaled
- H304 - May be fatal if swallowed and enters airways
- H370 - Causes damage to the following organs: respiratory system
- H372 - Causes damage to the following organs through prolonged or repeated exposure: respiratory system, teeth

## Precautionary statements-(Prevention)

- Wear protective gloves/protective clothing/eye protection/face protection
- 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

- Keep only in original container

**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 ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
- Wash contaminated clothing before reuse
- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
- IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
- Rinse mouth
- Do NOT induce vomiting
- Absorb spillage to prevent material damage

**Precautionary statements-(Storage)**

- Store locked up
- Store in corrosive resistant/ container with a resistant inner liner

**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     |
|---------------------------------|---------------------|------------------|---------|-----------|------------|
| Trinitratonitrosylruthenium(II) | 10.0 - 20.0 (as Ru) | 317.09           | N/A     | 1-(3)-438 | 34513-98-9 |
| Water                           | <32                 | 18.01            | -       | N/A       | 7732-18-5  |
| Nitric Acid                     | 18                  | 63.01            | (1)-394 | *         | 7697-37-2  |

**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**

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment

**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.

#### 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 or cover with dry earth, sand or other non-combustible material and transfer to containers

#### 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

Avoid contact with alkaline substances. Avoid contact with organic substance Avoid contact with reducing agents and combustible materials. Avoid contact with metal. 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

Avoid contact with skin, eyes or clothing. Use personal protective equipment as required.

#### 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. Store locked up.

##### Safe packaging material

Glass

##### Incompatible substances

Organic substance, Combustible materials, Bases, Reducing agent, Metals

## 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                     |
|--------------------------|--|--------------|---------------------------|
| Nitric Acid<br>7697-37-2 | TWA: 2 ppm OEL<br>TWA: 5.2 mg/m <sup>3</sup> OEL | N/A          | STEL: 4 ppm<br>TWA: 2 ppm |

**Personal protective equipment**

|                                 |   |
|---------------------------------|---|
| <b>Respiratory protection</b>   | Gas mask for acidic gas ( JIS T 8152 )                        |
| <b>Hand protection</b>          | chemical protective gloves ( JIS T 8116 )                     |
| <b>Eye protection</b>           | protective eyeglasses or chemical safety goggles (JIS T 8147) |
| <b>Skin and body protection</b> | 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** brown - black

**Appearance** liquid

**Odor**

no data available

**Melting point/freezing point**

no data available

**Boiling point, initial boiling point and boiling range**

no data available

**Flammability**

no data available

**Evaporation rate:**

no data available

**Flammability (solid, gas):**

no data available

**Upper/lower flammability or explosive limits**

**Upper:**

no data available

**Lower:**

no data available

**Flash point**

no data available

**Auto-ignition temperature:**

no data available

**Decomposition temperature:**

no data available

**pH**

Strongly acidic

**Viscosity (coefficient of viscosity)**

no data available

**Dynamic viscosity**

no data available

**Solubilities**

water : soluble .

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

no data available

**Vapour pressure**

no data available

**Specific Gravity / Relative density**

1.65

**Vapour density**

no data available

**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

**Incompatible materials**

Organic substance, Combustible materials, Bases, Reducing agent, Metals

**Hazardous decomposition products**

Nitrogen oxides (NOx), Metal oxides

## Section 11: TOXICOLOGICAL INFORMATION

**Acute toxicity**

| Chemical Name | Oral LD50 | Dermal LD50 | Inhalation LC50 |
|---------------|-----------|-------------|-----------------|
|---------------|-----------|-------------|-----------------|

|             |                    |     |                       |
|-------------|--------------------|-----|-----------------------|
| Water       | > 90 mL/kg ( Rat ) | N/A | N/A                   |
| Nitric Acid | N/A                | N/A | 334 ppm ( Rat ) 0.5 h |

| Chemical Name | Acute toxicity -oral- source information      | Acute toxicity -dermal- source information    | Acute toxicity -inhalation gas- source information |
|---------------|---|---|--|
| Nitric Acid   | 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 |
|---------------|--|---|---|
| Nitric Acid   | 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  |
|---------------|---|
| Nitric Acid   | Based on the NITE GHS classification results. |

**Serious eye damage/ irritation**

| Chemical Name | Serious eye damage/irritation source information |
|---------------|--|
| Nitric Acid   | Based on the NITE GHS classification results.    |

**Respiratory or skin sensitization**

| Chemical Name | Respiratory or Skin sensitization source information |
|---------------|--|
| Nitric Acid   | Based on the NITE GHS classification results.        |

**Reproductive cell mutagenicity**

| Chemical Name | germ cell mutagenicity source information     |
|---------------|---|
| Nitric Acid   | Based on the NITE GHS classification results. |

**Carcinogenicity**

| Chemical Name | Carcinogenicity source information            |
|---------------|---|
| Nitric Acid   | Based on the NITE GHS classification results. |

| Chemical Name                                 | NTP | IARC | ACGIH | JSOH (Japan) |
|---|-----|------|-------|--------------|
| Trinitratonitrosylruthenium(II)<br>34513-98-9 | -   |      |       | -            |

**Reproductive toxicity**

| Chemical Name | Reproductive toxicity source information      |
|---------------|---|
| Nitric Acid   | Based on the NITE GHS classification results. |

**STOT-single exposure**

| Chemical Name | STOT -single exposure- source information     |
|---------------|---|
| Nitric Acid   | Based on the NITE GHS classification results. |

**STOT-repeated exposure**

| Chemical Name | STOT -repeated exposure- source information   |
|---------------|---|
| Nitric Acid   | Based on the NITE GHS classification results. |

**Aspiration hazard**

| Chemical Name | Aspiration Hazard source information          |
|---------------|---|
| Nitric Acid   | Based on the NITE GHS classification results. |

## Section 12: ECOLOGICAL INFORMATION

**Ecotoxicity**

| Chemical Name | Algae/aquatic plants | Fish   | Crustacea |
|---------------|----------------------|--|-----------|
| Nitric Acid   | N/A                  | LC50 : <i>Gambusia affinis</i><br>72 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 |
|---------------|--|---|
| Nitric Acid   | 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>               | UN2031         |
| <b>Proper shipping name:</b>   | Nitric acid    |
| <b>UN classification</b>       | 8              |
| <b>Subsidiary hazard class</b> |                |
| <b>Packing group</b>           | II             |
| <b>Marine pollutant</b>        | Not applicable |

#### IMDG

|   |                          |
|---|--------------------------|
| <b>UN number</b>  | UN2031                   |
| <b>Proper shipping name:</b>  | Nitric acid              |
| <b>UN classification</b>  | 8                        |
| <b>Subsidiary hazard class</b>  |                          |
| <b>Packing group</b>  | II                       |
| <b>Marine pollutant (Sea)</b>   | Not applicable           |
| <b>Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code</b> | No information available |

#### IATA

|  |                |
|--|----------------|
| <b>UN number</b>                           | UN2031         |
| <b>Proper shipping name:</b>               | Nitric acid    |
| <b>UN classification</b>                   | 8              |
| <b>Subsidiary hazard class</b>             |                |
| <b>Packing group</b>                       | II             |
| <b>Environmentally Hazardous Substance</b> | Not applicable |

### Section 15: REGULATORY INFORMATION

#### Japanese regulations

|  |  |
|--|--|
| <b>Fire Service Act</b>  | Not applicable   |
| <b>Poisonous and Deleterious Substances Control Law</b>                    | Deleterious Substances 2nd. Grade  |
| <b>Industrial Safety and Health Act</b>                                    | Harmful Substances Whose Names Are to be Indicated on the Label (Law Art.57)<br>Notifiable Substances (Law Art.57-2)<br>Group 3 Specified Chemical Substance, (Ordinance on Prevention of Hazards Due to Specified Chemical Substances Art.2 Para.1, Item 6) |
| <b>Industrial Safety and Health Act (2024~)</b>                            | 【2024.4.1~】Chemical Substances Hazardous to Skin, etc.(Regulations Article 594-2 Paragraph 1)  |
| <b>Regulations for the carriage and storage of dangerous goods in ship</b> | Corrosive Substances (Ordinance Art.3, Ministry of Transportation Ordinance Regarding Transport by Ship and Storage, Attached Table 1)   |

|  |   |
|--|---|
| <b>Civil Aeronautics Law</b>                                   | Corrosive Substances (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  |
| <b>Pollutant Release and Transfer Register Law (2023.4.1-)</b> | Not applicable  |
| <b>Water Pollution Control Act</b>                             | Harmful Substances (Law Art.2, Enforcement Order Art.2, Ordinance Designating Wastewater Standards Art.1)               |

| 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-) |
|---------------------------------|--|--|---|
| Nitric Acid<br>7697-37-2 ( 18 ) | 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**