

SAFETY DATA SHEET

According to JIS Z 7253:2019
Revision Date 22-Dec-2020
 Version 1

Section 1: PRODUCT AND COMPANY IDENTIFICATION

| | |
|---------------------|---------------------------------------|
| Product name | Zirconium Standard Solution (Zr 1000) |
| Product code | 265-02291 |

Manufacturer FUJIFILM Wako Pure Chemical Corporation
 1-2 Doshomachi 3-Chome
 Chuo-ku, Osaka 540-8605, Japan
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Recommended uses and restrictions on use For research use only

Section 2: HAZARDS IDENTIFICATION

GHS classification

Classification of the substance or mixture

| | |
|--|------------|
| Corrosive to metals | Category 1 |
| Acute toxicity - Oral | Category 4 |
| Skin corrosion/irritation | Category 1 |
| Serious eye damage/eye irritation | Category 1 |
| Respiratory sensitization | Category 1 |
| Specific target organ toxicity (single exposure) | Category 2 |
| Category 2 respiratory system | |
| Specific target organ toxicity (repeated exposure) | Category 2 |
| Category 2 respiratory system, teeth | |
| Short-term (acute) hazardous to the aquatic environment | Category 2 |

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
- H302 - Harmful if swallowed
- H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
- H401 - Toxic to aquatic life
- H371 - May cause damage to the following organs: respiratory system
- H373 - May cause damage to the following organs through prolonged or repeated exposure: respiratory system, teeth

Precautionary statements-(Prevention)

- Wash face, hands and any exposed skin thoroughly after handling
- Do not eat, drink or smoke when using this product
- Do not breathe dust/fume/gas/mist/vapors/spray
- Wear protective gloves/protective clothing/eye protection/face protection
- In case of inadequate ventilation wear respiratory protection
- Avoid release to the environment
- 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: Call a POISON CENTER or doctor/physician if you feel unwell
- 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 |
|------------------------|----------|------------------|---------|----------|------------|
| Water | 92.9 | 18.02 | N/A | N/A | 7732-18-5 |
| Hydrochloric Acid | 7 | 36.46 | (1)-215 | 公表 | 7647-01-0 |
| Zirconium(IV) Chloride | 0.1 | 233.04 | (1)-659 | 公表 | 10026-11-6 |

Impurities and/or Additives : Not applicable

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 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**

Avoid contact with alkaline substances. 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

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

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

Store away from sunlight in well-ventilated place at room temperature (under 25 °C).
Keep container tightly closed.

Safe packaging material

Polyethylene

Incompatible substances

Bases, 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 |
|--------------------------------------|-----------------------------|--------------|--|
| Hydrochloric Acid 7647-01-0 | 5ppm(7.5mg/m ³) | N/A | Ceiling: 2 ppm |
| Zirconium(IV) Chloride 10026-11-6 | N/A | N/A | STEL: 10 mg/m ³ Zr TWA: 5 mg/m ³ Zr |

Personal protective equipment**Respiratory protection**

Gas mask for acidic gas

Hand protection Impermeable protective gloves
Eye protection protective eyeglasses or chemical safety goggles
Skin and body protection Long-sleeved work clothes
General hygiene considerations
 Handle in accordance with good industrial hygiene and safety practice.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Form

Color colorless
Turbidity clear
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 No data available
Viscosity (coefficient of viscosity) No data available
Dynamic viscosity No data available
Solubilities No data available
n-Octanol/water partition coefficient:(log Pow) No data available
Vapour pressure No data available
Specific Gravity / Relative density No data available
Vapour density No data available
Particle characteristics No data available

Section 10: STABILITY AND REACTIVITY

Stability

Reactivity No data available
Chemical stability Stable under recommended storage conditions.

Hazardous reactions
 None under normal processing

Conditions to avoid
 Extremes of temperature and direct sunlight

Incompatible materials
 Bases, Metals

Hazardous decomposition products
 Halides, Metal oxides

Section 11: TOXICOLOGICAL INFORMATION

Acute toxicity

| Chemical Name | Oral LD50 | Dermal LD50 | Inhalation LC50 |
|------------------------|--------------------|----------------------|------------------|
| Hydrochloric Acid | 238 mg/kg (rat) | >5010 mg/kg (rabbit) | 1411 ppm(rat) 4h |
| Zirconium(IV) Chloride | 1688 mg/kg (Rat) | N/A | N/A |

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

| | | | |
|------------------------|---|---|---|
| Zirconium(IV) Chloride | 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 |
|------------------------|--|---|---|
| Hydrochloric Acid | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. | Based on the NITE GHS Classification results. |
| Zirconium(IV) Chloride | 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 |
|------------------------|---|
| Hydrochloric Acid | Based on the NITE GHS classification results. |
| Zirconium(IV) Chloride | Based on the NITE GHS classification results. |

Serious eye damage/ irritation

| Chemical Name | Serious eye damage/irritation source information |
|------------------------|--|
| Hydrochloric Acid | Based on the NITE GHS classification results. |
| Zirconium(IV) Chloride | Based on the NITE GHS classification results. |

Respiratory or skin sensitization

| Chemical Name | Respiratory or Skin sensitization source information |
|------------------------|--|
| Hydrochloric Acid | Based on the NITE GHS classification results. |
| Zirconium(IV) Chloride | Based on the NITE GHS classification results. |

Reproductive cell mutagenicity

| Chemical Name | germ cell mutagenicity source information |
|------------------------|---|
| Hydrochloric Acid | Based on the NITE GHS classification results. |
| Zirconium(IV) Chloride | Based on the NITE GHS classification results. |

Carcinogenicity

| Chemical Name | Carcinogenicity source information |
|------------------------|---|
| Hydrochloric Acid | Based on the NITE GHS classification results. |
| Zirconium(IV) Chloride | Based on the NITE GHS classification results. |

| Chemical Name | NTP | IARC | ACGIH | JSOH (Japan) |
|--------------------------------|-----|--------------------|-------|--------------|
| Hydrochloric Acid 7647-01-0 | N/A | Group 1 Group 3 | N/A | N/A |

Reproductive toxicity

| Chemical Name | Reproductive toxicity source information |
|------------------------|---|
| Hydrochloric Acid | Based on the NITE GHS classification results. |
| Zirconium(IV) Chloride | Based on the NITE GHS classification results. |

STOT-single exposure

| Chemical Name | STOT -single exposure- source information |
|------------------------|---|
| Hydrochloric Acid | Based on the NITE GHS classification results. |
| Zirconium(IV) Chloride | Based on the NITE GHS classification results. |

STOT-repeated exposure

| Chemical Name | STOT -repeated exposure- source information |
|------------------------|---|
| Hydrochloric Acid | Based on the NITE GHS classification results. |
| Zirconium(IV) Chloride | Based on the NITE GHS classification results. |

Aspiration hazard

| Chemical Name | Aspiration Hazard source information |
|------------------------|---|
| Hydrochloric Acid | Based on the NITE GHS classification results. |
| Zirconium(IV) Chloride | Based on the NITE GHS classification results. |

Section 12: ECOLOGICAL INFORMATION

Ecotoxicity

| Chemical Name | Algae/aquatic plants | Fish | Crustacea |
|------------------------|----------------------|--|--|
| Hydrochloric Acid | N/A | N/A | EC50: <i>Daphnia magna</i> 0.492 mg/L 48h |
| Zirconium(IV) Chloride | N/A | LC50 <i>Oncorhynchus mykiss</i> : 20000ugZr/L 96h | 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 |
|------------------------|--|---|
| Hydrochloric Acid | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. |
| Zirconium(IV) Chloride | 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 |

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 | UN1789 |
| Proper shipping name: | hydrochloric acid |
| UN classification | 8 |
| Subsidiary hazard class | |
| Packing group | II |
| Marine pollutant | Not applicable |

IMDG

| | |
|---|--------------------------|
| UN number | UN1789 |
| Proper shipping name: | hydrochloric acid |
| UN classification | 8 |
| Subsidiary hazard class | |
| Packing group | II |
| Marine pollutant (Sea) | Not applicable |
| Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code | No information available |

IATA

| | |
|--|-------------------|
| UN number | UN1789 |
| Proper shipping name: | hydrochloric acid |
| UN classification | 8 |
| Subsidiary hazard class | |
| Packing group | II |
| Environmentally Hazardous Substance | Not applicable |

Section 15: REGULATORY INFORMATION

International Inventories

| | |
|----------------------|---|
| EINECS/ELINCS | - |
| TSCA | - |

Japanese regulations

| | |
|---|--|
| Fire Service Act | Not applicable |
| Poisonous and Deleterious Substances Control Law | Not applicable |
| Industrial Safety and Health Act | Harmful Substances Whose Names Are to be Indicated on the Label (Law Art.57, Para.1, Enforcement Order Art.18) |

| | |
|--|---|
| Regulations for the carriage and storage of dangerous goods in ship | Notifiable Substances (Law Art.57-2, Enforcement Order Art.18-2 Attached Table No.9)No.98 Group 3 Specified Chemical Substance, (Ordinance on Prevention of Hazards Due to Specified Chemical Substances Art.2 Para.1, Item 6) |
| Civil Aeronautics Law | Corrosive Substances (Ordinance Art.3, Ministry of Transportation Ordinance Regarding Transport by Ship and Storage, Attached Table 1) |
| Marine Pollution Prevention Law | Corrosive Substances (Ordinance Art.194, MITL Notification for Air Transportation of Explosives etc., Attached Table 1) |
| Pollutant Release and Transfer Register Law | Enforcement ordinance Appendix No. 1 Noxious liquid substance Category Z Not applicable |
| Water Pollution Control Act | Specified substances(Law Art.2 Para.4, Enforcement Order Art.3-3) |
| Export Trade Control Order | Appendix 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 |
|--------------------------------------|--|--|---|
| Hydrochloric Acid 7647-01-0 (7) | - | 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

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 Z7252(2019). *JIS: Japanese Industrial Standards

End of Safety Data Sheet