

SAFETY DATA SHEET

According to JIS Z 7253:2019
Revision date 21-Feb-2024
 Revision Number 3.04

Section 1: PRODUCT AND COMPANY IDENTIFICATION

| | |
|---------------------|-------------------------------------|
| Product Name | Multielement Standard Solution W-XI |
| Product Code | 131-16211 |

Supplier FUJIFILM Wako Pure Chemical Corporation
 1-2 Doshomachi 3-Chome, Chuo-ku, Osaka 540-8605, Japan
 Phone: +81-6-6203-3741
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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

| | |
|---|------------|
| Corrosive to metals | Category 1 |
| Acute toxicity - Inhalation (Vapors) | Category 4 |
| Skin corrosion/irritation | Category 2 |
| Serious eye damage/eye irritation | 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 | |

Pictograms



Signal word

Danger

Hazard statements

- H290 - May be corrosive to metals
- H315 - Causes skin irritation
- H318 - Causes serious eye damage
- H332 - Harmful if inhaled
- 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)

- Use only outdoors or in a well-ventilated area
- Wash face, hands and any exposed skin thoroughly after handling
- Wear protective gloves/protective clothing/eye protection/face protection
- Do not breathe dust/fume/gas/mist/vapors/spray
- Do not eat, drink or smoke when using this product
- Keep only in original container

Precautionary statements-(Response)

- IF exposed or if you feel unwell: Call a POISON CENTER or doctor/physician
- 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: Wash with plenty of soap and water
- If skin irritation occurs: Get medical advice/attention
- Take off contaminated clothing and wash before reuse
- 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
- 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 | 96.52 | 18.02 | N/A | N/A | 7732-18-5 |
| Nitric Acid | 3.2 | 63.01 | (1)-394 | * | 7697-37-2 |
| Beryllium sulfate tetrahydrate | 0.14 | 177.14 | (1)-597 | * | 7787-56-6 |
| Cobalt(II) nitrate hexahydrate | 0.049 | 291.03 | 1-266 | * | 10026-22-9 |
| Nitric acid, gallium salt | 0.037 | Ga(NO ₃) ₃ = 255.74 | N/A | 1-(3)-356 | 13494-90-1 |
| Yttrium Nitrate n-hydrate | 0.031 | Y(NO ₃) ₃ = 274.92 | 1-789 | * | 13470-40-1 |
| Thallium(I) nitrate | 0.013 | 266.39 | (1)-1170 | * | 10102-45-1 |
| Indium | 0.010 | 114.818 | - | N/A | 7440-74-6 |

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 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. 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

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. Store locked up.

Safe packaging material

Polyethylene

Incompatible substances

Alkali, 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 7697-37-2 | TWA: 2 ppm OEL TWA: 5.2 mg/m ³ OEL | N/A | STEL: 4 ppm TWA: 2 ppm |

| | | | |
|--|---|-----------------------------------|--|
| Beryllium sulfate tetrahydrate 7787-56-6 | TWA: 0.002 mg/m ³ OEL ISHL/ACL: 0.001 mg/m ³ | ISHL/ACL: 0.001 mg/m ³ | TWA: 0.00005 mg/m ³ Be inhalable particulate matter |
| Cobalt(II) nitrate hexahydrate 10026-22-9 | TWA: 0.05 mg/m ³ OEL ISHL/ACL: 0.02 mg/m ³ | ISHL/ACL: 0.02 mg/m ³ | TWA: 0.02 mg/m ³ Co inhalable particulate matter |
| Yttrium Nitrate n-hydrate 13470-40-1 | N/A | N/A | TWA: 1 mg/m ³ Y |
| Thallium(I) nitrate 10102-45-1 | N/A | N/A | TWA: 0.02 mg/m ³ TI inhalable particulate matter Skin |
| Indium 7440-74-6 | N/A | N/A | TWA: 0.1 mg/m ³ |

Personal protective equipment

| | |
|---------------------------------|---|
| Respiratory protection | Gas mask for acidic 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 | slightly red- pale brown , or pale yellowish brown |
| 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

Strongly acidic

Viscosity (coefficient of viscosity)

no data available

Dynamic viscosity

no data available

Solubilities

water : miscible .

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 | May be altered by light. |

Hazardous reactions

Corrodes metals to generate hydrogen gas.

Conditions to avoid

Extremes of temperature and direct sunlight

Incompatible materials

Alkali, Metals

Hazardous decomposition products

Nitrogen oxides (NOx), Metal oxides

Section 11: TOXICOLOGICAL INFORMATION**Acute toxicity**

| Chemical Name | Oral LD50 | Dermal LD50 | Inhalation LC50 |
|--------------------------------|------------------------|---------------------|--|
| Nitric Acid | N/A | N/A | 334 ppm (Rat) 0.5 h |
| Beryllium sulfate tetrahydrate | 7.0 mg/kg (Rat, as Be) | N/A | 0.15 mg/m ³ (Rat, as Be) 4h |
| Cobalt(II) nitrate hexahydrate | 691 mg/kg (Rat) | 171 mg/kg (Mouse) | N/A |
| Thallium(I) nitrate | 15 mg/kg (Mouse) | N/A | N/A |
| Indium | 4200 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 |
|--------------------------------|---|---|---|
| Nitric Acid | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. |
| Beryllium sulfate tetrahydrate | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. |
| Cobalt(II) nitrate hexahydrate | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. |
| Thallium(I) nitrate | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. |
| Indium | 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. |
| Beryllium sulfate tetrahydrate | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. |
| Cobalt(II) nitrate hexahydrate | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. |
| Thallium(I) nitrate | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. |
| Indium | 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. |
| Beryllium sulfate tetrahydrate | Based on the NITE GHS classification results. |
| Cobalt(II) nitrate hexahydrate | Based on the NITE GHS classification results. |
| Thallium(I) nitrate | Based on the NITE GHS classification results. |
| Indium | 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. |
| Beryllium sulfate tetrahydrate | Based on the NITE GHS classification results. |
| Cobalt(II) nitrate hexahydrate | Based on the NITE GHS classification results. |
| Thallium(I) nitrate | Based on the NITE GHS classification results. |
| Indium | 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. |
| Beryllium sulfate tetrahydrate | Based on the NITE GHS classification results. |

| | |
|--------------------------------|---|
| Cobalt(II) nitrate hexahydrate | Based on the NITE GHS classification results. |
| Thallium(I) nitrate | Based on the NITE GHS classification results. |
| Indium | 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. |
| Beryllium sulfate tetrahydrate | Based on the NITE GHS classification results. |
| Cobalt(II) nitrate hexahydrate | Based on the NITE GHS classification results. |
| Thallium(I) nitrate | Based on the NITE GHS classification results. |
| Indium | Based on the NITE GHS classification results. |

Carcinogenicity

| Chemical Name | Carcinogenicity source information |
|--------------------------------|---|
| Nitric Acid | Based on the NITE GHS classification results. |
| Beryllium sulfate tetrahydrate | Based on the NITE GHS classification results. |
| Cobalt(II) nitrate hexahydrate | Based on the NITE GHS classification results. |
| Thallium(I) nitrate | Based on the NITE GHS classification results. |
| Indium | Based on the NITE GHS classification results. |

| Chemical Name | NTP | IARC | ACGIH | JSOH (Japan) |
|--|------------------------|------|-------|--------------|
| Beryllium sulfate tetrahydrate 7787-56-6 | Known | - | A1 | Group 1 |
| Cobalt(II) nitrate hexahydrate 10026-22-9 | Reasonably Anticipated | - | A3 | Group 2B |
| Indium 7440-74-6 | - | - | - | Group 2A |

Reproductive toxicity

| Chemical Name | Reproductive toxicity source information |
|--------------------------------|---|
| Nitric Acid | Based on the NITE GHS classification results. |
| Beryllium sulfate tetrahydrate | Based on the NITE GHS classification results. |
| Cobalt(II) nitrate hexahydrate | Based on the NITE GHS classification results. |
| Thallium(I) nitrate | Based on the NITE GHS classification results. |
| Indium | 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. |
| Beryllium sulfate tetrahydrate | Based on the NITE GHS classification results. |
| Cobalt(II) nitrate hexahydrate | Based on the NITE GHS classification results. |
| Thallium(I) nitrate | Based on the NITE GHS classification results. |
| Indium | 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. |
| Beryllium sulfate tetrahydrate | Based on the NITE GHS classification results. |
| Cobalt(II) nitrate hexahydrate | Based on the NITE GHS classification results. |
| Thallium(I) nitrate | Based on the NITE GHS classification results. |
| Indium | Based on the NITE GHS classification results. |

Aspiration hazard

| Chemical Name | Aspiration Hazard source information |
|--------------------------------|---|
| Nitric Acid | Based on the NITE GHS classification results. |
| Beryllium sulfate tetrahydrate | Based on the NITE GHS classification results. |
| Cobalt(II) nitrate hexahydrate | Based on the NITE GHS classification results. |
| Thallium(I) nitrate | Based on the NITE GHS classification results. |
| Indium | 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> 72 mg/L 96 h | N/A |
| Beryllium sulfate tetrahydrate | N/A | LC50 : <i>Poecilia reticulata</i> 0.16 mg/L (as Be) 96 h | N/A |
| Thallium(I) nitrate | N/A | N/A | EC50 : <i>Daphnia magna</i> 0.665 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 |
|--------------------------------|--|---|
| Nitric Acid | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. |
| Beryllium sulfate tetrahydrate | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. |
| Cobalt(II) nitrate hexahydrate | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. |
| Thallium(I) nitrate | Based on the NITE GHS classification results. | Based on the NITE GHS classification results. |
| Indium | 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 | UN2031 |
| Proper shipping name: | Nitric acid |
| UN classification | 8 |
| Subsidiary hazard class | |
| Packing group | II |
| Marine pollutant | Not applicable |

IMDG

| | |
|---|--------------------------|
| UN number | UN2031 |
| Proper shipping name: | Nitric 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 | UN2031 |
| Proper shipping name: | Nitric acid |
| UN classification | 8 |
| Subsidiary hazard class | |

Packing group II
 Environmentally Hazardous Substance Not applicable

Section 15: REGULATORY INFORMATION

Japanese regulations

Fire Service Act Not applicable
Poisonous and Deleterious Substances Control Law Deleterious 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)
 Group 3 Specified Chemical Substance, (Ordinance on Prevention of Hazards Due to Specified Chemical Substances Art.2 Para.1, Item 6)
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 Corrosive Substances (Ordinance Art.3, Ministry of Transportation Ordinance Regarding Transport by Ship and Storage, Attached Table 1)
Civil Aeronautics Law Corrosive Substances (Ordinance Art.194, MITL Notification for Air Transportation of Explosives etc., Attached Table 1)
Marine Pollution Prevention Law Enforcement ordinance Appendix No. 1 Noxious liquid substance Category Y
Pollutant Release and Transfer Register Law (2023.4.1-) Not applicable
Water Pollution Control Act Harmful Substances (Law Art.2, Enforcement Order Art.2, Ordinance Designating Wastewater Standards Art.1)
Export Trade Control Order Appendix 1 Export licensed items
Air Pollution Control Law Hazardous Air Pollutants, Priority Chemical Substances

| 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 7697-37-2 (3.2) | - | Applicable | - |
| Beryllium sulfate tetrahydrate 7787-56-6 (0.14) | - | Applicable | - |
| Thallium(I) nitrate 10102-45-1 (0.013) | 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. Product and company Identification.
 Composition/information on ingredients. Exposure controls/personal protection. Stability and reactivity. Toxicological information. Ecological information. 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