SAFETY DATA SHEET

According to JIS Z 7253:2019
Revision date 21-Feb-2024
Revision Number 1.04

Section 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name	Multielement Standard Solution W-X
Product Code	134-16201

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

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

Pictograms

Signal word Warning

Hazard statements
H290 - May be corrosive to metals
H315 - Causes skin irritation
H319 - Causes serious eye irritation
H332 - Harmful 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)
- 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

- Avoid release to the environment
- 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
- If eye irritation persists: Get medical advice/attention
- 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	98.3	18.02	N/A	N/A	7732-18-5
Nitric Acid	1.3	63.01	(1)-394	*	7697-37-2
Aluminium nitrate nonahydrate	0.14	375.13	1-20	*	7784-27-2
Chromium(III) nitrate nonahydrate	0.077	238.01	(1)-281	*	7789-02-8
Manganese(II), hydrate	0.052	N/A	(1)-470	*	15710-66-4
Zinc Nitrate Hexahydrate	0.046	297.49	1-491	*	10196-18-6
Copper(II) nitrate trihydrate	0.038	241.60	(1)-296	*	10031-43-3
Cadmium nitrate tetrahydrate	0.027	308.48	(1)-201	*	10022-68-1
Lead(II) nitrate	0.016	331.21	(1)-488	*	10099-74-8
Diarsenic Trioxide	0.013	197.84	(1)-35,(9)-2400	*	1327-53-3
Selenious acid	0.010	128.97	(1)-431	*	7783-00-8

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 contaminent and methods and materials for cleaning up

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

Recoverly, 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	Store away from sunlight in well-ventilated place at room temperature (preferably cool). Keep container tightly closed. Store locked up.
Safe packaging material	Polyethylene
Incompatible substances	alkaline substances, 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/m³ OEL	N/A	STEL: 4 ppm TWA: 2 ppm
Chromium(III) nitrate nonahydrate 7789-02-8	TWA: 0.5 mg/m³ OEL	N/A	N/A
Manganese(II), hydrate 15710-66-4	TWA: 0.1 mg/m³ OEL TWA: 0.02 mg/m³ OEL ISHL/ACL: 0.05 mg/m³	ISHL/ACL: 0.2 mg/m³	TWA: 0.02 mg/m³ Mn respirable particulate matter TWA: 0.1 mg/m³ Mn inhalable particulate matter
Copper(II) nitrate trihydrate 10031-43-3	N/A	N/A	TWA: 1 mg/m³ Cu dust and mist
Cadmium nitrate tetrahydrate 10022-68-1	TWA: 0.05 mg/m³ OEL ISHL/ACL: 0.05 mg/m³	ISHL/ACL: 0.05 mg/m³	TWA: 0.01 mg/m³ Cd TWA: 0.002 mg/m³ Cd respirable particulate matter
Lead(II) nitrate 10099-74-8	TWA: 0.03 mg/m³ OEL ISHL/ACL: 0.05 mg/m³	ISHL/ACL: 0.05 mg/m³	TWA: 0.05 mg/m³ Pb
Diarsenic Trioxide 1327-53-3	ISHL/ACL: 0.003 mg/m³	ISHL/ACL: 0.003 mg/m³	TWA: 0.01 mg/m³ As
Selenious acid 7783-00-8	TWA: 0.1 mg/m³ OEL	N/A	TWA: 0.2 mg/m³ Se

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 Blue
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 acidic
Viscosity (coefficient of viscosity) no data available
Dynamic viscosity no data available
Solubilities water , nitric acid : 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 Stable under recommended storage conditions.

Hazardous reactions

Corrodes metals to generate hydrogen gas.

Conditions to avoid

Extremes of temperature and direct sunlight

Incompatible materials

alkaline substances, 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
Chromium(III) nitrate nonahydrate	3250 mg/kg (Rat)	N/A	N/A
Zinc Nitrate Hexahydrate	1,330 mg/kg (Rat)	N/A	N/A
Copper(II) nitrate trihydrate	940 mg/kg (Rat)	N/A	N/A
Cadmium nitrate tetrahydrate	300 mg/kg (Rat)	N/A	N/A
Lead(II) nitrate	93 mg/kg (Rat)	N/A	N/A
Diarsenic Trioxide	25 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.
Zinc Nitrate Hexahydrate	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Copper(II) nitrate trihydrate	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Cadmium nitrate tetrahydrate	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Lead(II) nitrate	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Diarsenic Trioxide	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Selenious 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.
Zinc Nitrate Hexahydrate	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Copper(II) nitrate trihydrate	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Cadmium nitrate tetrahydrate	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.

Lead(II) nitrate	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Diarsenic Trioxide	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Selenious 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.
Zinc Nitrate Hexahydrate	Based on the NITE GHS classification results.
Copper(II) nitrate trihydrate	Based on the NITE GHS classification results.
Cadmium nitrate tetrahydrate	Based on the NITE GHS classification results.
Lead(II) nitrate	Based on the NITE GHS classification results.
Diarsenic Trioxide	Based on the NITE GHS classification results.
Selenious 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.
Zinc Nitrate Hexahydrate	Based on the NITE GHS classification results.
Copper(II) nitrate trihydrate	Based on the NITE GHS classification results.
Cadmium nitrate tetrahydrate	Based on the NITE GHS classification results.
Lead(II) nitrate	Based on the NITE GHS classification results.
Diarsenic Trioxide	Based on the NITE GHS classification results.
Selenious 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.
Zinc Nitrate Hexahydrate	Based on the NITE GHS classification results.
Copper(II) nitrate trihydrate	Based on the NITE GHS classification results.
Cadmium nitrate tetrahydrate	Based on the NITE GHS classification results.
Lead(II) nitrate	Based on the NITE GHS classification results.
Diarsenic Trioxide	Based on the NITE GHS classification results.
Selenious acid	Based on the NITE GHS classification results.

Reproductive cell mutagenicity

Chemical Name	germ cell mutagencity source information
Nitric Acid	Based on the NITE GHS classification results.
Zinc Nitrate Hexahydrate	Based on the NITE GHS classification results.
Copper(II) nitrate trihydrate	Based on the NITE GHS classification results.
Cadmium nitrate tetrahydrate	Based on the NITE GHS classification results.
Lead(II) nitrate	Based on the NITE GHS classification results.
Diarsenic Trioxide	Based on the NITE GHS classification results.
Selenious acid	Based on the NITE GHS classification results.

Carcinogenicity

Chemical Name	Carcinogenicity source information
Nitric Acid	Based on the NITE GHS classification results.
Zinc Nitrate Hexahydrate	Based on the NITE GHS classification results.
Copper(II) nitrate trihydrate	Based on the NITE GHS classification results.
Cadmium nitrate tetrahydrate	Based on the NITE GHS classification results.
Lead(II) nitrate	Based on the NITE GHS classification results.
Diarsenic Trioxide	Based on the NITE GHS classification results.
Selenious acid	Based on the NITE GHS classification results.

Chemical Name	NTP	IARC	ACGIH	JSOH (Japan)
Aluminium nitrate nonahydrate 7784-27-2	N/A	Group 2A	N/A	N/A
Zinc Nitrate Hexahydrate 10196-18-6		Group 2A		
Copper(II) nitrate trihydrate	-	Group 2A	-	-

10031-43-3				
Cadmium nitrate tetrahydrate 10022-68-1	Known	Group 1	A2	Group 1
Lead(II) nitrate 10099-74-8	Reasonably Anticipated	Group 2A	A3	Group 2B
Diarsenic Trioxide 1327-53-3	Known	Group 1	A1	Group 1
Selenious acid 7783-00-8		Group 3		

Reproductive toxicity

Chemical Name	Reproductive toxicity source information
Nitric Acid	Based on the NITE GHS classification results.
Zinc Nitrate Hexahydrate	Based on the NITE GHS classification results.
Copper(II) nitrate trihydrate	Based on the NITE GHS classification results.
Cadmium nitrate tetrahydrate	Based on the NITE GHS classification results.
Lead(II) nitrate	Based on the NITE GHS classification results.
Diarsenic Trioxide	Based on the NITE GHS classification results.
Selenious 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.
Zinc Nitrate Hexahydrate	Based on the NITE GHS classification results.
Copper(II) nitrate trihydrate	Based on the NITE GHS classification results.
Cadmium nitrate tetrahydrate	Based on the NITE GHS classification results.
Lead(II) nitrate	Based on the NITE GHS classification results.
Diarsenic Trioxide	Based on the NITE GHS classification results.
Selenious 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.
Zinc Nitrate Hexahydrate	Based on the NITE GHS classification results.
Copper(II) nitrate trihydrate	Based on the NITE GHS classification results.
Cadmium nitrate tetrahydrate	Based on the NITE GHS classification results.
Lead(II) nitrate	Based on the NITE GHS classification results.
Diarsenic Trioxide	Based on the NITE GHS classification results.
Selenious 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.
Zinc Nitrate Hexahydrate	Based on the NITE GHS classification results.
Copper(II) nitrate trihydrate	Based on the NITE GHS classification results.
Cadmium nitrate tetrahydrate	Based on the NITE GHS classification results.
Lead(II) nitrate	Based on the NITE GHS classification results.
Diarsenic Trioxide	Based on the NITE GHS classification results.
Selenious 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 : Gambusia affinis 72 mg/L 96 h*	*N/A*
Copper(II) nitrate trihydrate	*N/A*	*N/A*	*LC50:Ceriodaphnia affinis 9.5 µg/L 48 h*
Lead(II) nitrate	*N/A*	*N/A*	*LC50 : Gammaridae 0.124 mg/L 96 h*

Diarsenic Trioxide	*N/A*	*LC50:Oncorhynchus mykiss 18.8 - 21.4 mg/L 96 h LC50:Pimephales promelas 135 mg/L 96 h LC50:Oncorhynchus mykiss 1000 mg/L 96 h*	*EC50 : Artemia franciscana 0.257 mg/L 24 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.
Zinc Nitrate Hexahydrate	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Copper(II) nitrate trihydrate	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Cadmium nitrate tetrahydrate	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Lead(II) nitrate	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Diarsenic Trioxide	Based on the NITE GHS classification results.	Based on the NITE GHS classification results.
Selenious acid	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 classfication 8
Subsidiary hazard class
Packing group II
Marine pollutant Not applicable

IMDG
UN number UN2031
Proper shipping name: Nitric acid
UN classfication 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 classfication	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	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) 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 Nortification 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, Ordinace Designating Wastewater Standards Art.1)
Export Trade Control Order	Not applicable
Soil Contamination Control Law	Designated Hazardous 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 (1.3)	-	Applicable	-
Aluminium nitrate nonahydrate 7784-27-2 (0.14)	-	Applicable	-
Diarsenic Trioxide 1327-53-3 (0.013)	Applicable	-	-
Selenious acid 7783-00-8 (0.010)	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 Oraganic Chemistry , SSOCJ, Koudansha Scientific Co.Ltd. Chemical Dictionary, Kyouritsu Publishing Co., Ltd. etc
Record of SDS revisions	The following contents were revised. Prodauct 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