Safety Data Sheet

32 Mix metal standard solution

Version：V2.0.0.1
Report No.：BWB2456-2016-MSDS-US
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*Prepared according to American OSHA HCS-2024 (29 CFR 1910.1200)

1 Identification

Product identifier

Product Name	32 Mix metal standard solution
Cat No.	BWB2456-2016
CAS No.	Not applicable
EC No.	Not applicable
Molecular Formula	Not applicable

Recommended use of the product and restrictions on use

Relevant identified uses	Please consult manufacturer.
Uses advised against	Please consult manufacturer.

Details of the supplier of the Safety Data Sheet

Name of the company	Weiyel Inc
Address of the company	Hedian Light Industrial Park, Chengguan Town, Shangcheng County, Xinyang City, Henan Province, China
Post code	465350
Telephone number	010-58103678
Fax number	010-84840368
E-mail address	info@weiyel.com

Emergency phone number

Emergency phone number	010-58103678

2 Hazard(s) identification

Hazard classification according to 29 CFR 1910.1200

Skin corrosion/irritation	Category 1C
Serious eye damage/irritation	Category 1
Acute Toxicity - Inhalation	Category 1

Label elements

Hazard pictograms	
Signal word	Danger

Hazard statements

H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage
H330	Fatal if inhaled

Precautionary statements

◆ Prevention

P260	Do not breathe gas/mist/vapour/spray.
P264	Wash hands and other parts of the body (if related) thoroughly after handling.
P271	Use only outdoors or with adequate ventilation.
P280	Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.
P284	In case of inadequate ventilation wear respiratory protection.

◆ Response

P320	Specific treatment is urgent (see related instructions on the label).
P321	Specific treatment (see related instructions on the label).
P363	Wash contaminated clothing before reuse.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P301+P330+P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse affected areas with water [or shower].
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

◆ Storage

P405	Store locked up.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.

◆ Disposal

P501	Dispose of contents/container in accordance with local/regional/national/international regulations.

Other hazards

	Not applicable.

Hazard description

◆ Physical and chemical hazards

	No information available

◆ Health hazards

Inhaled	Inhalation of vapours or aerosols (mists, fumes), generated by the product during the course of normal handling, may produce severely toxic effects; these may be fatal. Corrosive product can cause irritation of the respiratory tract, with coughing, choking and mucous membrane damage.
Ingestion	Accidental ingestion of the product may be harmful to the health of the individual.
Skin Contact	The product can cause severe skin burns following direct contact with the skin.
Eye	The product can produce severe chemical burns to the eye following direct contact. If timely and appropriate treatment is not available may cause permanent blindness.

◆ Environmental hazards

	Please refer to 12th chapter of SDS.

3 Composition/information on ingredients

Substance/mixture

	Mixture

Component	CAS No.	EC No.	Concentration (wt, %)
Ammonium dihydrogen phosphate	7722-76-1	231-764-5	0.03
Nickel	7440-02-0	231-111-4	0.01
Silver nitrate	7761-88-8	231-853-9	0.02
Diarsenic trioxide	1327-53-3	215-481-4	0.01
Boric acid	10043-35-3	233-139-2	0.05
Beryllium	7440-41-7	231-150-7	0.01
Calcium carbonate	471-34-1	207-439-9	0.03
Cadmium	7440-43-9	231-152-8	0.01
Cobalt	7440-48-4	231-158-0	0.01
Copper	7440-50-8	231-159-6	0.01
Iron	7439-89-6	231-096-4	0.01
Potassium nitrate	7757-79-1	231-818-8	0.03
Lithium carbonate	554-13-2	209-062-5	0.05
Magnesium	7439-95-4	231-104-6	0.01
Manganese	7439-96-5	231-105-1	0.01
Ammonium molybdate(VI)	13106-76-8	236-031-3	0.02
Sodium carbonate	497-19-8	207-838-8	0.02
Lead	7439-92-1	231-100-4	0.01
Antimony	7440-36-0	231-146-5	0.01
Selenium	7782-49-2	231-957-4	0.01
Silicon	7440-21-3	231-130-8	0.01
Tin	7440-31-5	231-141-8	0.01
Strontium carbonate	1633-05-2	216-643-7	0.07
Titanium	7440-32-6	231-142-3	0.01
Thallium nitrate	10102-45-1	233-273-1	0.01
Zinc	7440-66-6	231-175-3	0.01
ZIRCONIUM NITRATE (ZIRCONYL)	12372-57-5	-	0.04
Bismuth	7440-69-9	231-177-4	0.01
Chromium trinitrate	13548-38-4	236-921-1	0.08

Aluminum nitrate nonahydrate	7784-27-2	616-523-8	0.14
Ammonium trioxovanadate	7803-55-6	232-261-3	0.02
Barium nitrate	10022-31-8	233-020-5	0.01
Nitric acid	7697-37-2	231-714-2	15
Water	7732-18-5	231-791-2	84.21

4 First-aid measures

Description of first aid measures

General advice	Immediate medical attention is required. Show this safety data sheet (SDS) to the doctor in attendance.
Eye contact	Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician if feel uncomfortable.
Skin contact	Take off contaminated clothing and shoes immediately. Wash off with plenty of soap and water for at least 15 minutes and consult a physician if feel uncomfortable.
Ingestion	Never give anything by mouth to an unconscious person. Call a physician or Poison Control Center immediately.
Inhalation	Move victim into fresh air. If breathing is difficult, give oxygen. Do not use mouth to mouth resuscitation if victim ingested or inhaled the substance. If not breathing, give artificial respiration and consult a physician immediately.
Protecting of first-aiders	Ensure that medical personnel are aware of the substance involved. Take precautions to protect themselves and prevent spread of contamination.

Most important symptoms/effects, acute and delayed

1	Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.

Indication of any immediate medical attention and special treatment needed

1	Treat symptomatically.
2	Symptoms may be delayed.

5 Fire-fighting measures

Extinguishing media

Suitable extinguishing media	Small fire: dry chemical, CO_2 or water spray; Large fire: dry chemical, CO_2 , alcohol-resistant foam or water spray; Fire involving tanks, rail tank cars or highway tanks: Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Do not get water inside containers.
Unsuitable extinguishing media	No information available.

Specific hazards arising from the substance or mixture

1	Fire may produce irritating, poisonous or corrosive gases.
2	Development of hazardous combustion gases or vapor possible in the event of fire.
3	May expansion or decompose explosively when heated or involved in fire.

Special protective equipment and precautions for fire-fighters

1	As in any fire, wear self-contained breathing apparatus (MSHA/NIOSH approved or equivalent) and full

	protective gear.
2	Fight fire from a safe distance, with adequate cover.
3	Prevent fire extinguishing water from contaminating surface water or the ground water system.

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

1	Fully encapsulating, vapor protective clothing should be worn for spills and leaks with no fire.
2	Do not touch or walk through spilled material.
3	Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
4	Use personal protective equipment,do not breathe gas/mist/vapour/spray.
5	Ensure adequate ventilation. Remove all sources of ignition. Take precautionary measures against static discharges.
6	Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

Environmental precautions

1	Prevent further leakage or spillage if safe to do so.
2	Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up

1	Do not touch or cross spills.
2	It is recommended that emergency personnel wear a self-contained breathing apparatus with positive pressure and wear anti-corrosion clothing.
3	Transfer to a tank truck or special collector with a corrosion-resistant pump.
4	Do not touch broken containers and spills before putting on appropriate protective clothing.
5	Cut off the source of the leak as much as possible.
6	Keep leaks in a ventilated place.
7	Absorb spilled material in dry sand or inert absorbent. In case of large amount of spillage, contain a spill by bunding.
8	Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment.
9	Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container.

7 Handling and storage

Precautions for safe handling

1	Handling is performed in a well ventilated place.
2	Wear suitable protective equipment.
3	Avoid contact with skin and eyes.
4	Keep away from heat/sparks/open flames/ hot surfaces.

Conditions for safe storage, including any incompatibilities

1	Keep containers tightly closed.
2	Keep containers in a dry, cool and well-ventilated place.
3	Keep away from heat/sparks/open flames/hot surfaces.
4	Store away from incompatible materials and foodstuff containers.

8 Exposure controls/personal protection

Control parameters

◆Occupational exposure limit values

Component	Country/Region	Limit value - Eight hours		Limit value - Short term	
		ppm	mg/m³	ppm	mg/m³
Nickel	Japan - JSOH(2024–2025)	-	1	-	-
	Permissible exposure standards for workers in the workplace	-	1	-	2
	Australia	-	1	-	-
	Canada - Ontario	-	1	-	-
	New Zealand	-	0.005	-	-
	USA - ACGIH	-	1.5(inhalable fraction)	-	-
Silver nitrate	Japan - JSOH(2024–2025)	-	0.01(as Ag)	-	-
	Permissible exposure standards for workers in the workplace	-	0.01(dust and fume, as Ag)	-	0.03(dust and fume, as Ag)
	USA - ACGIH	-	0.01(as Ag)	-	-
	Finland	-	0.01	-	0.03
Diarsenic trioxide	Japan - JSOH(2024–2025)	-	0.003(as As, individual excess lifetime risk of cancer 10^-3)	-	-
	Permissible exposure standards for workers in the workplace	-	0.01(as As)	-	0.03(as As)
	USA - ACGIH	-	0.01(as As)	-	-
	Austria	-	0.01	-	0.04
	Finland	-	0.01	-	-
	Hungary	-	-	-	0.1
Boric acid	Canada - Ontario	-	2	-	6
	USA - ACGIH	-	2(Inhalable fraction)	-	6(Inhalable fraction)
	Belgium	-	2	-	6
	Canada - Québec	-	2	-	6
	Germany (AGS)	-	0.5	-	1
	Germany (DFG)	-	10(inhalable aerosol)	-	10(inhalable aerosol)

Beryllium	Japan - JSOH(2024–2025)	-	0.002	-	-
	Permissible exposure standards for workers in the workplace	-	0.002(as Be)	-	0.006(as Be)
	Australia	-	0.002	-	-
	Canada - Ontario	-	0.002	-	0.01
	European Union	-	0.0002	-	-
	New Zealand	-	0.0002	-	-
Calcium carbonate	Australia	-	10	-	-
	New Zealand	-	10	-	-
	USA - NIOSH	10	5	-	-
	USA - OSHA	-	15	-	-
	Canada - Québec	-	10	-	-
	France	-	10(inhalable aerosol)	-	-
Cadmium	Japan - JSOH(2024–2025)	-	0.05	-	-
	Permissible exposure standards for workers in the workplace	-	0.05(as Cd)	-	0.15(as Cd)
	Australia	-	0.01	-	-
	Canada - Ontario	-	0.01(inhalable fraction)	-	-
	European Union	-	0.001	-	-
	New Zealand	-	0.004	-	-
Cobalt	Japan - JSOH(2024–2025)	-	0.05	-	-
	Permissible exposure standards for workers in the workplace	-	0.05(dust and fume)	-	0.15(dust and fume)
	Australia	-	0.05	-	-
	Canada - Ontario	-	0.02	-	-
	New Zealand	-	0.02	-	-
	USA - ACGIH	-	0.02(inhalable fraction)	-	-
Copper	Permissible exposure standards for workers in the workplace	-	1(dust and mist)	-	2(dust and mist)
	Permissible exposure	-	0.2(fume)	-	0.6(fume)

	standards for workers in the workplace				
	Australia	-	0.2(fume, respirable fraction)	-	-
	Canada - Ontario	-	0.2(fume, respirable fraction)	-	-
	New Zealand	-	0.01	-	-
	USA - ACGIH	-	1(dust and mist)	-	-
Manganese	Japan - JSOH(2024–2025)	-	0.02(respirable particles, as Mn)	-	-
	Japan - JSOH(2024–2025)	-	0.1(total particulate, as Mn)	-	-
	Permissible exposure standards for workers in the workplace	-	1(fume)	-	2(fume)
	Australia	-	1	-	-
	Canada - Ontario	-	0.2	-	-
	European Union	-	0.2	-	-
Ammonium molybdate(VI)	USA - ACGIH	-	0.5(as Mo, respirable fraction)	-	-
Sodium carbonate	Romania	-	1	-	3
Lead	Japan - JSOH(2024–2025)	-	0.03(as Pb)	-	-
	Permissible exposure standards for workers in the workplace	-	0.05	-	0.15
	Australia	-	0.05	-	-
	Canada - Ontario	-	0.05	-	-
	European Union	-	0.15	-	-
	New Zealand	-	0.05	-	-
Antimony	Japan - JSOH(2024–2025)	-	0.1	-	-
	Permissible exposure standards for workers in the workplace	-	0.5	-	1.5
	Australia	-	0.5	-	-
	Canada - Ontario	-	0.5	-	-
	New Zealand	-	0.5	-	-

	USA - ACGIH	-	0.5	-	-
Selenium	Japan - JSOH(2024–2025)	-	0.1	-	-
	Permissible exposure standards for workers in the workplace	-	0.2(as Se)	-	0.6(as Se)
	Australia	-	0.1	-	-
	Canada - Ontario	-	0.2	-	-
	New Zealand	-	0.1	-	-
	USA - ACGIH	-	0.2	-	-
Silicon	Australia	-	10	-	-
	Canada - Ontario	-	10	-	-
	New Zealand	-	10	-	-
	USA - NIOSH	-	10	-	-
	USA - OSHA	-	15	-	-
	Belgium	-	10	-	-
Tin	Permissible exposure standards for workers in the workplace	-	2	-	4
	Australia	-	2	-	-
	Canada - Ontario	-	2	-	-
	USA - ACGIH	-	2(inhalable fraction)	-	-
	USA - OSHA	-	0.1	-	-
	Austria	-	2(inhalable aerosol)	-	4(inhalable aerosol)
Titanium	Latvia	-	10	-	-
	Poland	-	10	-	15
	Romania	-	10	-	15
Thallium nitrate	USA - ACGIH	-	0.02(as Tl, inhalable fraction)	-	-
Zinc	Germany (DFG)	-	2	-	4
	Switzerland	-	0.1(respirable aerosol)	-	0.4(respirable aerosol)
Chromium trinitrate	Japan - JSOH(2024–2025)	-	0.5(as Cr)	-	-
	Permissible exposure standards for workers in the workplace	-	0.5 (as Cr)	-	1.5 (as Cr)
	USA - ACGIH	-	0.003(as Cr(III),	-	-

			inhalable fraction)		
Barium nitrate	Permissible exposure standards for workers in the workplace	-	0.5(as Ba)	-	1.5(as Ba)
	USA - ACGIH	-	0.5(as Ba)	-	-
	USA - NIOSH	-	0.5	-	-
	USA - OSHA	-	0.5	-	-
	Finland	-	0.5	-	-
Nitric acid	Japan - JSOH(2024–2025)	2	5.2	-	-
	Permissible exposure standards for workers in the workplace	2	5.2	4	10.4
	Australia	2	5.2	4	10
	Canada - Ontario	2	-	4	-
	European Union	-	-	1	2.6
	New Zealand	2	5.2	4	10

Engineering controls

1	Ensure adequate ventilation, especially in confined areas.
2	Ensure that eyewash stations and safety showers are close to the workstation location.
3	Use explosion-proof electrical/ventilating/lighting/equipment.
4	Set up emergency exit and necessary risk-elimination area.

Personal protection equipment

General requirement	
Eye protection	Must wear appropriate anti-corrosion goggles.
Hand protection	Must wear acid and alkali resistant chemical protective gloves.
Respiratory protection	Must wear appropriate personal dust proof gas mask.
Skin and body protection	Must wear acid and alkali resistant chemical protective clothing.

9 Physical and chemical properties and safety characteristics

Physical and chemical properties

Appearance (physical state, color, etc.)	Clear, colorless liquid
Odor	No information available
Odor threshold	No information available
pH	< 1 (Nitric acid)
Melting point/freezing point(°C)	-41.6 (Nitric acid)

Initial boiling point and boiling range(°C)	121 (Nitric acid)
Flash point(Closed cup,°C)	No information available
Evaporation rate	No information available
Flammability	No information available
Upper/lower explosive limits[%(v/v)]	Upper limit : No information available ; Lower limit : No information available
Vapor pressure	6.4kPa (20°C ,Nitric acid)
Vapor density(Air = 1)	2.2 (Nitric acid)
Relative density(Water=1)	1.4 (Nitric acid)
Solubility	500000mg/L (20 °C,Nitric acid)
n-octanol/water partition coefficient	-0.21 (Nitric acid)
Auto-ignition temperature(°C)	No information available
Decomposition temperature(°C)	No information available
Kinematic viscosity	No information available

10 Stability and reactivity

Stability and reactivity

Reactivity	Contact with incompatible substances can cause decomposition or other chemical reactions.
Chemical stability	Stable under proper operation and storage conditions.
Possibility of hazardous reactions	Reacts severely with halogens, interhalogens or other strong oxidants, or causes a fire. Mixture with active metal powders may explode intensely if heated. Reacts with active metals and poses an explosive potential or fire. May burn continuously in carbon dioxide. May react with strong acids, strong alkalis, strong oxidants or strong reducing agents. Mixtures with metallic acetylene, when heated, cause a fire or incandescence. In contact with active metals (alkali metals, Na, Ca etc.) causes a reaction and release hydrogen.
Conditions to avoid	Incompatible materials, heat, flame and spark.
Incompatible materials	Halogen, interhalogen, strong oxidant, water and acids. Active metal powder, non-metal elemental powder, sulfide, metal amino compound, metal acetylene compound, phenols, metal sulfamate, metal cyanide, thiocyanate, phosphide, hypophosphite, carboxylic acid, carboxylic anhydride , Carboxylic acid esters, ethanol, reducing agents and performic acid. Active metal, alcohols, aldehydes, carbon disulfide, carbon, sulfur, phosphorus, boron, reducing agents, metallic acetylenes and metallic carbonates. Water, carbon dioxide, oxidants, halogen, interhalogen and mercury. Strong acids, strong alkalis, strong oxidants and strong reducing agents. Metal acetylide, halogen, interhalogen, halogen oxides, nitric acid, nitrous oxide, nitrates, nitrites, halogen oxyacid salts, chromates, permanganates, inorganic peroxides, metal oxides and peroxyformic acid. Alkali, sodium, calcium, and other active metal, halogen, metal oxide, nonmetal oxide, acyl halide and metal phosphide.
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11 Toxicological information

Acute toxicity

Component	LD_{50}(oral)	LD_{50}(dermal)	LC_{50}(inhalation,4h)
Chromium trinitrate	3250mg/kg(Rat)	No information available	No information available
Silver nitrate	1173mg/kg(Rat)	No information available	No information available
Aluminum nitrate nonahydrate	3671mg/kg(Rat)	No information available	No information available
Bismuth	5000mg/kg(Rat)	No information available	No information available
Boric acid	2660mg/kg(Rat)	No information available	No information available
Cobalt	6171mg/kg(Rat)	No information available	No information available
Cadmium	2330mg/kg(Rat)	No information available	No information available
Manganese	9000mg/kg(Rat)	No information available	No information available
Barium nitrate	355mg/kg(Rat)	No information available	No information available
Iron	30000mg/kg(Rat)	No information available	No information available
Potassium nitrate	3750mg/kg(Rat)	No information available	No information available
Ammonium trioxovanadate	58.1mg/kg(Rat)	2102mg/kg(Rat)	0.0078mg/L(Rat)
Silicon	3160mg/kg(Rat)	No information available	No information available
Antimony	7000mg/kg(Rat)	No information available	No information available
Thallium nitrate	15mg/kg(Mouse)	No information available	No information available
Lithium carbonate	525mg/kg(Rat)	No information available	No information available
Sodium carbonate	4090mg/kg(Rat)	No information available	No information available
Selenium	6700mg/kg(Rat)	No information available	5.67mg/L(Rat)
Diarsenic trioxide	14.6mg/kg(Rat)	No information available	No information available

Carcinogenicity

Component	List of carcinogens by the IARC Monographs	Report on Carcinogens by NTP	OSHA Carcinogen List
Ammonium dihydrogen phosphate	Not Listed	Not Listed	Not Listed
Nickel	Category 2B	Category R	Not Listed
Silver nitrate	Not Listed	Category R	Not Listed
Diarsenic trioxide	Category 1	Category K	Listed
Boric acid	Not Listed	Not Listed	Not Listed
Beryllium	Category 1	Category K	Not Listed
Calcium carbonate	Not Listed	Not Listed	Not Listed
Cadmium	Category 1	Category K	Listed
Cobalt	Category 2A	Category R	Not Listed
Copper	Not Listed	Not Listed	Not Listed
Iron	Not Listed	Not Listed	Not Listed
Potassium nitrate	Not Listed	Not Listed	Not Listed
Lithium carbonate	Not Listed	Not Listed	Not Listed

Magnesium	Not Listed	Not Listed	Not Listed
Manganese	Not Listed	Not Listed	Not Listed
Ammonium molybdate(VI)	Not Listed	Not Listed	Not Listed
Sodium carbonate	Not Listed	Not Listed	Not Listed
Lead	Category 2B	Category R	Not Listed
Antimony	Not Listed	Not Listed	Not Listed
Selenium	Category 3	Not Listed	Not Listed
Silicon	Not Listed	Not Listed	Not Listed
Tin	Not Listed	Not Listed	Not Listed
Strontium carbonate	Not Listed	Not Listed	Not Listed
Titanium	Not Listed	Not Listed	Not Listed
Thallium nitrate	Not Listed	Not Listed	Not Listed
Zinc	Not Listed	Not Listed	Not Listed
ZIRCONIUM NITRATE (ZIRCONYL)	Not Listed	Not Listed	Not Listed
Bismuth	Not Listed	Not Listed	Not Listed
Chromium trinitrate	Category 3	Not Listed	Not Listed
Aluminum nitrate nonahydrate	Not Listed	Not Listed	Not Listed
Ammonium trioxovanadate	Not Listed	Not Listed	Not Listed
Barium nitrate	Not Listed	Not Listed	Not Listed
Nitric acid	Not Listed	Not Listed	Not Listed
Water	Not Listed	Not Listed	Not Listed

Others

32 Mix metal standard solution	
Skin corrosion/irritation	Causes severe skin burns and eye damage(Category 1C)
Serious eye damage/irritation	Causes serious eye damage(Category 1)
Skin sensitization	Based on available data, the classification criteria are not met
Respiratory sensitization	Based on available data, the classification criteria are not met
Reproductive toxicity	Based on available data, the classification criteria are not met
STOT-repeated exposure	Based on available data, the classification criteria are not met
Aspiration hazard	Based on available data, the classification criteria are not met
Germ cell mutagenicity	Based on available data, the classification criteria are not met

12 Ecological information

Acute aquatic toxicity

Component	Fish	Crustaceans	Algae or other aquatic plants
Chromium trinitrate	LC_{50} : 20.1mg/L (96h)(Fish)	No information available	ErC_{50} : 0.105mg/L (96h)(Algae)

Silver nitrate	LC_{50} : 0.0109mg/L (96h)(Fish)	EC_{50} : 0.0029mg/L (48h)(Crustaceans)	No information available
Barium nitrate	LC_{50} : > 6.65mg/L (96h)(Fish)	EC_{50} : 27.6mg/L (48h)(Crustaceans)	ErC_{50} : > 30.1mg/L (72h)(Algae)
Iron	LC_{50} : 1.29mg/L (96h)(Fish)	No information available	No information available
Copper	LC_{50} : 0.665mg/L (96h)(Fish)	EC_{50} : 0.02mg/L (48h)(Crustaceans)	ErC_{50} : 7.9mg/L (96h)(Algae)
Nickel	LC_{50} : 40mg/L (96h)(Fish)	EC_{50} : 1mg/L (48h)(Crustaceans)	No information available
Lithium carbonate	LC_{50} : 30.3mg/L (96h)(Fish)	EC_{50} : 33.2mg/L (48h)(Crustaceans)	ErC_{50} : > 400mg/L (72h)(Algae)
Sodium carbonate	LC_{50} :300mg/L (96h)(Fish)	EC_{50} : 200mg/L (48h)(Crustaceans)	No information available
Diarsenic trioxide	LC_{50} : 12.6mg/L (96h)(Fish)	No information available	ErC_{50} : 25.2mg/L (72h)(Algae)
Selenium	LC_{50} : 2.06mg/L (96h)(Fish)	No information available	ErC_{50} : 96mg/L (96h)(Algae)
Ammonium molybdate(VI)	LC_{50} :550mg/L (96h)(Fish)	No information available	No information available
Aluminum nitrate nonahydrate	LC_{50} : 4.25mg/L (96h)(Fish)	No information available	No information available
Magnesium	LC_{50} :541mg/L (96h)(Fish)	No information available	No information available
Bismuth	LC_{50} :100mg/L (96h)(Fish)	EC_{50} : > 100mg/L (48h)(Crustaceans)	No information available
Cobalt	LC_{50} : 1.5mg/L (96h)(Fish)	No information available	No information available
Ammonium dihydrogen phosphate	No information available	EC_{50} : > 100mg/L (48h)(Crustaceans)	ErC_{50} : > 100mg/L (72h)(Algae)
Boric acid	LC_{50} :487mg/L (96h)(Fish)	EC_{50} : 226mg/L (48h)(Crustaceans)	ErC_{50} : 290mg/L (72h)(Algae)
Strontium carbonate	LC_{50} : 40.3mg/L (96h)(Fish)	No information available	No information available
Manganese	LC_{50} : 1800mg/L (96h)(Fish)	EC_{50} : 40mg/L (48h)(Crustaceans)	No information available
Cadmium	LC_{50} : 7.8mg/L (96h)(Fish)	EC_{50} : 0.58mg/L (48h)(Crustaceans)	No information available
Zinc	LC_{50} : 2.01mg/L (96h)(Fish)	EC_{50} : 1.33mg/L (48h)(Crustaceans)	No information available
Ammonium trioxovanadate	LC_{50} : 0.693mg/L (96h)(Fish)	No information available	No information available
Potassium nitrate	LC_{50} : > 100mg/L (96h)(Fish)	EC_{50} : 490mg/L (48h)(Crustaceans)	No information available
Silicon	LC_{50} :100mg/L (96h)(Fish)	No information available	No information available
Lead	LC_{50} : 2.8mg/L (96h)(Fish)	No information available	No information available
Tin	LC_{50} : > 0.0124mg/L (96h)(Fish)	No information available	No information available

| Chronic aquatic toxicity

Component	Fish	Crustaceans	Algae or other aquatic plants
Potassium nitrate	NOEC : 58mg/L(Fish)	No information available	No information available

Boric acid	No information available	No information available	NOEC : 82mg/L(Algae)
Lithium carbonate	NOEC : 17.35mg/L(Fish)	No information available	No information available
Barium nitrate	NOEC : > 2.39mg/L(Fish)	No information available	No information available
Selenium	NOEC : 0.025mg/L(Fish)	No information available	No information available

Persistence and degradability

Component	Persistence (water/soil)	Persistence (air)
Nickel	Low	Low
Boric acid	Low	Low
Lithium carbonate	Low	Low
Strontium carbonate	Low	Low
Thallium nitrate	Low	Low
Ammonium trioxovanadate	High	High

Bioaccumulative potential

Component	Bioaccumulative potential	Comments
Nickel	Low	Log Kow=-1.38
Boric acid	Low	BCF=0
Lithium carbonate	Low	Log Kow=-0.4605
Ammonium molybdate(VI)	Low	BCF=5.7
Strontium carbonate	Low	Log Kow=-0.4605
Thallium nitrate	Low	Log Kow=0.209
Ammonium trioxovanadate	Low	Log Kow=2.229

Mobility in soil

Component	log Koc	Remark
Nickel	1.155	
Boric acid	1.545	
Lithium carbonate	0.000	
Magnesium	1.12	20 ℃
Silicon	1.00	20 ℃
Strontium carbonate	0.000	
Thallium nitrate	1.155	
Chromium trinitrate	0.00	20 ℃
Ammonium trioxovanadate	1.545	

13 Disposal considerations

Disposal considerations

Waste chemicals	Before disposal should refer to the relevant national and local laws and regulation. Recommend the use of incineration disposal.
Contaminated packaging	Containers may still present chemical hazard when empty. Keep away from hot and ignition source of fire. Return to supplier for recycling if possible.
Disposal recommendations	Refer to section waste chemicals and contaminated packaging.

14 Transport information

Label and Mark

Transporting Label	

IMDG-CODE

UN number	3264
UN proper shipping name	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
Transport hazard class	8
Transport subsidiary hazard class	None
Packing group	Ⅲ
Marine pollutant (Yes or no)	No

IATA-DGR

UN number	3264
UN proper shipping name	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
Transport hazard class	8
Transport subsidiary hazard class	None
Packing group	Ⅲ

UN-ADR

UN number	3264
UN proper shipping name	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S.
Transport hazard class	8
Transport subsidiary hazard class	None
Packing group	Ⅲ

Transport in bulk according to IMO instruments

◆ Transport in bulk according to Annex II of MARPOL and the IBC code

Not Available

◆ Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

Not Available

◆ Transport in bulk in accordance with the IGC Code

Not Available

Others

Precautions for transport	Transport vehicles should be equipped with the appropriate variety and quantity of fire equipment and emergency equipment leakage during transport. Before transport, should be preceded by checking whether container integrity, sealing. The transport unit must be placarded and marked in accordance with relevant transporting requirements.

15 Regulatory information

International chemical inventory

Component	A	B	C	D	E	F	G	H	I	J	K	L	M
Ammonium dihydrogen phosphate	√	√	√	√	√	√	√	√	√	√	√	√	√
Nickel	√	√	√	√	√	√	√	√	√	√	√	√	√
Silver nitrate	√	√	√	√	√	√	√	√	√	√	√	√	√
Diarsenic trioxide	√	√	√	√	√	√	√	√	√	√	√	√	√
Boric acid	√	√	√	√	√	√	√	√	√	√	√	√	√
Beryllium	√	√	√	√	√	√	√	√	√	√	√	√	√
Calcium carbonate	√	√	√	√	√	√	√	√	√	√	√	√	√
Cadmium	√	√	√	√	√	√	√	√	√	√	√	√	√
Cobalt	√	√	√	√	√	√	√	√	×	√	√	√	√
Copper	√	√	√	√	√	√	√	√	√	√	√	√	√
Iron	√	√	√	√	√	√	√	√	√	√	√	√	√
Potassium nitrate	√	√	√	√	√	√	√	√	√	√	√	√	√
Lithium carbonate	√	√	√	√	√	√	√	√	√	√	√	√	√
Magnesium	√	√	√	√	√	√	√	√	√	√	√	√	√
Manganese	√	√	√	√	√	√	√	√	√	√	√	√	√
Ammonium molybdate(VI)	√	√	√	√	√	√	√	√	√	×	×	√	√
Sodium carbonate	√	√	√	√	√	√	√	√	√	√	√	√	√
Lead	√	√	√	√	√	√	√	√	×	√	√	√	√
Antimony	√	√	√	√	√	√	√	√	√	√	√	√	√
Selenium	√	√	√	√	√	√	√	√	×	√	√	√	√
Silicon	√	√	√	√	√	√	√	√	√	√	√	√	√
Tin	√	√	√	√	√	√	√	√	√	√	√	√	√
Strontium carbonate	√	√	√	√	√	√	√	√	√	√	√	√	√
Titanium	√	√	√	√	√	√	√	√	√	√	√	√	√
Thallium nitrate	√	√	√	×	√	√	√	√	√	×	√	√	√
Zinc	√	√	√	√	√	√	√	√	×	√	√	√	√
ZIRCONIUM NITRATE (ZIRCONYL)	×	×	×	×	×	×	×	×	×	×	×	×	√
Bismuth	√	√	√	√	√	√	√	√	√	√	√	√	√

Chromium trinitrate	√	√	√	√	√	√	√	√	√	√	√	√	√
Aluminum nitrate nonahydrate	√	×	×	×	√	√	×	√	×	√	×	√	√
Ammonium trioxovanadate	√	√	√	√	√	√	√	√	√	√	√	√	√
Barium nitrate	√	√	√	√	√	√	√	√	√	√	√	√	√
Nitric acid	√	√	√	√	√	√	√	√	√	√	√	√	√
Water	√	√	√	√	√	√	√	√	√	√	√	√	√

【A】 China Inventory of Existing Chemical Substances(IECSC)
【B】 European Inventory of Existing Commercial Chemical Substances(EC inventory)
【C】 United States Toxic Substances Control Act Inventory(TSCA)
【D】 Canadian Domestic Substances List(DSL)
【E】 New Zealand Inventory of Chemicals(NZIoC)
【F】 Philippines Inventory of Chemicals and Chemical Substances(PICCS)
【G】 Korea Existing Chemicals Inventory(KECL)
【H】 Australian. Inventory of Industrial Chemical (AIICS)
【I】 Japan Inventory of Existing & New Chemical Substances(ENCS)
【J】 Thailand Existing Chemicals Inventory(TECI)
【K】 Mexico National Inventory of Chemical Substances (INSQ)
【L】 Russia Inventory of Existing Substances (DRAFT)
【M】 Inventory of Existing Chemical Substances in Taiwan, China (TCSI)

List of Chemical Substances under International Conventions

Component	A	B	C
Ammonium dihydrogen phosphate	×	×	×
Nickel	×	×	×
Silver nitrate	×	×	×
Diarsenic trioxide	×	×	×
Boric acid	×	×	×
Beryllium	×	×	×
Calcium carbonate	×	×	×
Cadmium	×	×	×
Cobalt	×	×	×
Copper	×	×	×
Iron	×	×	×
Potassium nitrate	×	×	×
Lithium carbonate	×	×	×
Magnesium	×	×	×
Manganese	×	×	×
Ammonium molybdate(VI)	×	×	×
Sodium carbonate	×	×	×
Lead	×	×	×
Antimony	×	×	×
Selenium	×	×	×

Silicon	×	×	×
Tin	×	×	×
Strontium carbonate	×	×	×
Titanium	×	×	×
Thallium nitrate	×	×	×
Zinc	×	×	×
ZIRCONIUM NITRATE (ZIRCONYL)	×	×	×
Bismuth	×	×	×
Chromium trinitrate	×	×	×
Aluminum nitrate nonahydrate	×	×	×
Ammonium trioxovanadate	×	×	×
Barium nitrate	×	×	×
Nitric acid	×	×	×
Water	×	×	×

【A】 The Montreal Protocol on Substances that Deplete the Ozone Layer
【B】 Stockholm Convention on Persistent Organic Pollutants (POPs)
【C】 Rotterdam Convention on the prior informed consent procedure for certain hazardous chemicals and pesticides in international trade

US chemical inventory

Component	A	B	C	D	E	F	G	H
Ammonium dihydrogen phosphate	×	×	×	×	×	×	×	×
Nickel	√	√	√	√	√	√	√	√
Silver nitrate	×	×	√	√	√	√	√	×
Diarsenic trioxide	×	√	√	√	√	√	√	×
Boric acid	×	×	×	×	×	×	×	×
Beryllium	√	×	√	√	√	√	√	×
Calcium carbonate	×	×	×	×	×	×	×	×
Cadmium	√	×	√	√	√	√	√	×
Cobalt	√	√	×	√	√	√	√	√
Copper	×	×	√	√	√	√	√	×
Iron	×	×	×	×	×	×	×	×
Potassium nitrate	×	×	×	√	√	√	√	×
Lithium carbonate	×	×	×	√	√	×	√	√
Magnesium	×	×	×	√	√	√	√	×
Manganese	√	×	×	√	√	√	√	×
Ammonium molybdate(VI)	×	×	×	×	√	×	√	×
Sodium carbonate	×	×	×	×	×	×	×	×

Lead	√	×	√	√	√	√	√	×
Antimony	√	×	√	√	√	√	√	×
Selenium	√	×	√	√	√	√	√	×
Silicon	×	×	×	√	√	√	×	×
Tin	×	×	×	√	√	√	√	×
Strontium carbonate	×	×	×	×	×	×	×	×
Titanium	×	×	×	×	√	×	√	×
Thallium nitrate	×	×	√	√	√	√	√	×
Zinc	×	×	√	√	√	√	√	×
ZIRCONIUM NITRATE (ZIRCONYL)	×	×	×	×	×	×	×	×
Bismuth	×	×	×	×	×	×	×	×
Chromium trinitrate	×	×	×	×	√	×	√	×
Aluminum nitrate nonahydrate	×	×	×	×	×	×	×	×
Ammonium trioxovanadate	×	×	√	√	√	√	√	×
Barium nitrate	×	×	×	√	√	√	√	×
Nitric acid	×	√	√	√	√	√	√	×
Water	×	×	×	×	×	×	×	×

[A] US Clean Air Act (CAA)- Section 112, Hazardous Air Pollutants
[B] US SARA 302- Extremely Hazardous Substance List
[C] US CERCLA- Hazardous Substances List
[D] US Massachusetts Right-to-Know Substance List
[E] US New Jersey Right to Know Hazardous Substance List
[F] US Pennsylvania Right to Know Hazardous Substance List
[G] US New York City Right-to-Know Hazardous Substance List
[H] US California Proposition 65 List

Note:
"√" Indicates that the substance included in the regulations.
"×" No data or not included in the regulations.

16 Other information

Information on revision

Creation Date	2025/10/10
Revision Date	-
Reason for revision	-

Reference

[1] IPCS: The International Chemical Safety Cards (ICSC), website: http://www.ilo.org/dyn/icsc/showcard.home.
[2] IARC, website: http://www.iarc.fr/.
[3] OECD: The Global Portal to Information on Chemical Substances, website: https://www.echemportal.org/echemportal/.
[4] CAMEO Chemicals, website: http://cameochemicals.noaa.gov/search/simple.
[5] NLM: ChemIDplus, website: http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp.
[6] EPA: Integrated Risk Information System, website: http://cfpub.epa.gov/iris/.
[7] U.S. Department of Transportation: ERG, website: http://www.phmsa.dot.gov/hazmat/library/erg.
[8] Germany GESTIS-database on hazard substance, website: http://gestis-en.itrust.de/.

Abbreviations and acronyms

CAS	Chemical Abstracts Service	UN	The United Nations
PC-STEL	Short term exposure limit	OECD	Organization for Economic Co-operation and Development
PC-TWA	Time Weighted Average	IMDG-CODE	International Maritime Dangerous Goods CODE
MAC	Maximum Allowable Concentration	IARC	International Agency for Research on Cancer
DNEL	Derived No Effect Level	ICAO	International Civil Aviation Organization
PNEC	Predicted No Effect Concentration	IATA	International Air Transportation Association
NOEC	No Observed Effect Concentration	ACGIH	American Conference of Governmental Industrial Hygienists
LC_{50}	Lethal Concentration 50%	NFPA	National Fire Protection Association
LD_{50}	Lethal Dose 50%	NTP	National Toxicology Program
EC_{50}	Effective Concentration 50%	PBT	Persistent, Bioaccumulative, Toxic
EC_X	Effective Concentration X%	vPvB	very Persistent, very Bioaccumulative
P_{OW}	Partition coefficient Octanol: Water	CMR	Carcinogens, mutagens or substances toxic to reproduction
BCF	Bioconcentration factor	RPE	Respiratory Protective Equipment
ED	Endocrine disruptor	HCS	Hazard Communication Standard

Disclaimer

This Safety Data Sheet (SDS) was prepared according to OSHA HCS-2024. The data included was derived from international authoritative database and provided by the enterprise. Other information was based on the present state of our knowledge. We try to ensure the correctness of all information. However, due to the diversity of information sources and the limitations of our knowledge, this document is only for user's reference. Users should make their independent judgment of suitability of this information for their particular purposes. We do not assume responsibility for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.