

SAFETY DATA SHEET

according to the OSHA
Hazard Communication Standard

Version 6.28
Revision Date 07/17/2026
Print Date 07/18/2026

SECTION 1. IDENTIFICATION

1.1 Product identifiers

Product name : TCLP Metals in Soil

Product Number : SQC005
Brand : Sigma-Aldrich

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Scientific research and development, Reagent for analysis
Restrictions on use : Not Available

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO 63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-
527-3887 CHEMTREC (International) 24
Hours/day; 7 Days/week

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Hazards for the product as supplied

Skin sensitisation : Category 1

Carcinogenicity : Category 1B
(Inhalation)

Short-term (acute) : Category 1
aquatic hazard

Long-term (chronic) aquatic hazard : Category 2

Other hazards

None known.

GHS label elements

Hazard pictograms :



Signal word : Danger

Hazard statements : H317 May cause an allergic skin reaction.
H350 May cause cancer by inhalation.
H400 Very toxic to aquatic life.
H411 Toxic to aquatic life with long lasting effects.

Precautionary statements : **Prevention:**
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P261 Avoid breathing dust.
P272 Contaminated work clothing must not be allowed out of the workplace.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P363 Wash contaminated clothing before reuse.
P391 Collect spillage.

Storage:

P405 Store locked up.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

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CAS-No. : Not Assigned

Components

Chemical name	CAS No./Unique ID	Concentration (% w/w)	Trade secret
Quartz (SiO ₂)	14808-60-7*	>= 90 - <= 100	-
Silver nitrate	7761-88-8*	< 0.1	-
Cobalt dichloride hexahydrate	7791-13-1*	>= 0.01 - < 0.1	-
nickel(II) nitrate	13138-45-9*	>= 0.01 - < 0.1	-
Cadmium nitrate	10325-94-7*	< 0.1	-
Mercury(II) nitrate	10045-94-0*	< 0.1	-
chromium trioxide	1333-82-0*	< 0.1	-

* Indicates that the identifier is a CAS No.

Actual concentration is withheld as a trade secret

SECTION 4. FIRST AID MEASURES

General advice	: Show this safety data sheet to the doctor in attendance.
If inhaled	: After inhalation: fresh air. Call in physician.
In case of skin contact	: In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Consult a physician.
In case of eye contact	: After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.
If swallowed	: After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.
Most important symptoms and effects, both acute and delayed	: The most important known symptoms and effects are described in the labelling (see section 2 GHS label elements) and/or in section 11
Protection of first-aiders	: For personal protection see section 8.
Notes to physician	: No data available

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media : For this substance/mixture no limitations of extinguishing agents are given.

Specific hazards during fire fighting : Not combustible.

Ambient fire may liberate hazardous vapours.

Hazardous combustion products : silicon oxides

Specific extinguishing methods : No data available

Further information : Suppress (knock down) gases/vapours/mists with a water spray jet.
Prevent fire extinguishing water from contaminating surface water or the ground water system.

Special protective equipment for fire-fighters : Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Advice for non-emergency personnel:
Avoid generation and inhalation of dusts in all circumstances.
Avoid substance contact.
Ensure adequate ventilation.
Evacuate the danger area, observe emergency procedures, consult an expert.
Advice for emergency responders:
Wear appropriate personal protective equipment, as indicated in Section 8.

Environmental precautions : Do not let product enter drains.

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Methods and materials for containment and cleaning up : Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully. Dispose of properly. Clean up affected area. Avoid generation of dusts.

SECTION 7. HANDLING AND STORAGE

For precautions see section 2 GHS label elements

Advice on safe handling : Work under hood. Do not inhale substance/mixture.

Further information on storage conditions : Tightly closed.
Dry.
Keep in a well-ventilated place.
Keep locked up or in an area accessible only to qualified or authorised persons.

Storage class : 6.1D, Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

Recommended storage temperature : Recommended storage temperature see product label.

Further information on storage stability : Store at Room Temperature.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Quartz (SiO ₂)	14808-60-7	TWA (Respirable dust)	0.05 mg/m ³	OSHA Z-1
		TWA (respirable)	10 mg/m ³ / %SiO ₂ +2	OSHA Z-3
		TWA (respirable)	250 mppcf / %SiO ₂ +5	OSHA Z-3
		TWA (Respirable particulate matter)	0.025 mg/m ³ (Silica)	ACGIH

		PEL (respirable)	0.05 mg/m ³	OSHA CARC
Silver nitrate	7761-88-8	TWA	0.01 mg/m ³ (Silver)	OSHA Z-1
		TWA	0.01 mg/m ³ (Silver)	ACGIH
		TWA	0.01 mg/m ³ (Silver)	NIOSH REL
Cobalt dichloride hexahydrate	7791-13-1	TWA (Inhalable particulate matter)	0.02 mg/m ³ (Cobalt)	ACGIH
nickel(II) nitrate	13138-45-9	TWA	1 mg/m ³ (Nickel)	OSHA Z-1
		TWA (Inhalable particulate matter)	0.1 mg/m ³ (Nickel)	ACGIH
		TWA	0.015 mg/m ³ (Nickel)	NIOSH REL
Cadmium nitrate	10325-94-7	TWA	0.01 mg/m ³ (cadmium)	ACGIH
		TWA (Respirable particulate matter)	0.02 mg/m ³ (cadmium)	ACGIH
		PEL	0.005 mg/m ³ (cadmium)	OSHA CARC
Mercury(II) nitrate	10045-94-0	TWA	0.025 mg/m ³ (Mercury)	ACGIH
		TWA (Vapour)	0.05 mg/m ³ (Mercury)	NIOSH REL
		C	0.1 mg/m ³ (Mercury)	NIOSH REL
chromium trioxide	1333-82-0	PEL	0.005 mg/m ³ (chromium)	OSHA CARC
		TWA	0.0002 mg/m ³ (chromium)	NIOSH REL
		TWA (Inhalable particulate matter)	0.0002 mg/m ³	ACGIH
		STEL (Inhalable particulate matter)	0.0005 mg/m ³	ACGIH

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sampling time	Permissible concentration	Basis
Cobalt dichloride hexahydrate	7791-13-1	Cobalt (Cobalt)	Urine	End of shift at end of workweek	15 µg/l	ACGIH BEI
nickel(II) nitrate	13138-45-9	Nickel (Nickel)	Urine	End of shift at end of workweek	5 µg/l	ACGIH BEI
		Nickel (Nickel)	Urine	End of shift at end of workweek	30 µg/l	ACGIH BEI
Cadmium nitrate	10325-94-7	cadmium (cadmium)	In blood	Not critical	5 µg/l	ACGIH BEI
		cadmium (cadmium)	Urine	Not critical	5 µg/g creatinine	ACGIH BEI

Engineering measures : No data available

Personal protective equipment

Respiratory protection : required when dusts are generated.

Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Recommended Filter type: : Filter type P3

The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Hand protection

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Material : Nitrile rubber
Break through time : 480 min
Glove thickness : 0.11 mm
Protective index : Full contact
Manufacturer : KCL 741 Dermatril® L

Material : Nitrile rubber
Break through time : 480 min
Glove thickness : 0.11 mm
Protective index : Splash contact
Manufacturer : KCL 741 Dermatril® L

Remarks : Handle with impervious gloves.
This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Eye protection : Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).
Safety glasses

Skin and body protection : protective clothing

Hygiene measures : Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : solid

Colour : No data available

Odour : No data available

Odour Threshold : No data available

pH : No data available

Melting point : No data available

Boiling point/boiling range : No data available

Flash point : No data available

Evaporation rate	: No data available
Flammability (solid, gas)	: The product is not flammable.
Flammability (liquids)	: No data available
Burning rate	: No data available
Upper explosion limit / Upper flammability limit	: No data available
Lower explosion limit / Lower flammability limit	: No data available
Vapour pressure	: No data available
Relative vapour density	: No data available
Relative density	: No data available
Density	: No data available
Water solubility	: No data available
Partition coefficient: n- octanol/water	: No data available
Autoignition temperature	: No data available
Decomposition temperature	: No data available
Viscosity, dynamic	: No data available
Viscosity, kinematic	: No data available
Flow time	: No data available
Explosive properties	: Not classified as explosive.
Oxidizing properties	: none
Particle characteristics Particle size	: No data available

SECTION 10. STABILITY AND REACTIVITY

Reactivity	: No data available
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Chemical stability	: The product is chemically stable under standard ambient conditions (room temperature) .
Possibility of hazardous reactions	: No data available
Conditions to avoid	: no information available
Incompatible materials	: Strong oxidizing agents
Hazardous decomposition products	: For Hazardous combustion products in the event of fire: see section 5

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Mixture

Acute toxicity

Oral: No data available

Inhalation: No data available

Dermal: No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitization

Mixture may cause an allergic skin reaction.

Germ cell mutagenicity

No data available

Carcinogenicity

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: OSHA specifically regulated carcinogen (Quartz (SiO₂))

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

11.2 Additional Information

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Components

Quartz (SiO₂)

Acute toxicity

Oral: No data available

Inhalation: No data available

Dermal: No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitization

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

No data available

Reproductive toxicity

No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Silver nitrate

Acute toxicity

Oral: No data available

Inhalation: No data available

Dermal: No data available

Skin corrosion/irritation

Skin - reconstructed human epidermis (RhE)

Result: Causes severe burns. - 3 - 60 min

(OECD Test Guideline 431)

Serious eye damage/eye irritation

Eyes - Rabbit

Result: Causes serious eye damage.

Remarks: (ECHA)

Remarks: Risk of permanent damage due to staining of the cornea.

Respiratory or skin sensitization

No data available

Germ cell mutagenicity

Test Type: Micronucleus test

Test system: Human lymphocytes

Result: negative

Test Type: In vitro mammalian cell gene mutation test

Test system: mouse lymphoma cells

Result: Positive results were obtained in some in vitro tests.

Method: OECD Test Guideline 474

Species: Rat - male and female

Result: Positive results were obtained in some in vivo tests.

Carcinogenicity

No data available

Reproductive toxicity

May damage the unborn child.

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure**Aspiration hazard**

No data available

Cobalt dichloride hexahydrate**Acute toxicity**

LD50 Oral - Rat - male and female - 537 mg/kg

(OECD Test Guideline 401)

Inhalation: No data available

LD50 Dermal - Rat - > 2,000 mg/kg

Remarks: (RTECS)

The value is given in analogy to the following substances: Tricobalt tetraoxide

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

Eyes - Rabbit

Result: Irreversible effects on the eye

(OECD Test Guideline 405)

Remarks: (in analogy to similar products)

The value is given in analogy to the following substances: Cobalt(II) chloride

Respiratory or skin sensitization

May cause allergic respiratory and skin reactions Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2) The value is given in analogy to the following substances:

Germ cell mutagenicity

Suspected of causing genetic defects.

Carcinogenicity

May cause cancer by inhalation.

Reproductive toxicity

May damage fertility.

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

nickel(II) nitrate**Acute toxicity**

LD50 Oral - Rat - male - 325 mg/kg

(OECD Test Guideline 401)

LC50 Inhalation - Rat - male and female - 4 h - 1.3 - 4.5 mg/l - dust/mist

(OECD Test Guideline 403)

Dermal: No data available

Skin corrosion/irritation

Skin - Rabbit

Result: Irritating to skin. - 4 h

(OECD Test Guideline 404)

Serious eye damage/eye irritation

Eyes - Rabbit

Result: Causes serious eye damage.

(OECD Test Guideline 405)

Respiratory or skin sensitization

Maximisation Test - Guinea pig

Result: positive

May cause an allergic skin reaction.

(Maximisation Test)

Germ cell mutagenicity

Suspected of causing genetic defects.

Carcinogenicity

May cause cancer by inhalation.

Reproductive toxicity

May damage the unborn child.

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard

No data available

Cadmium nitrate**Acute toxicity**

Acute toxicity estimate Oral - Not tested on animals - 100.1 mg/kg
(Expert judgement)

Acute toxicity estimate Inhalation - Not tested on animals - 0.051 mg/l - dust/mist
(Expert judgement)

Acute toxicity estimate Dermal - Not tested on animals - 1,100.1 mg/kg
(Expert judgement)

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitization

No data available

Germ cell mutagenicity

May cause genetic defects.

In vivo tests showed mutagenic effects

Test Type: Ames test

Test system: Salmonella typhimurium

Result: negative

Remarks: (in analogy to similar products)

The value is given in analogy to the following substances: Cadmium chloride

Test Type: comet assay

Test system: mammalian cells

Result: positive

Remarks: (in analogy to similar products)

The value is given in analogy to the following substances: cadmium sulphate

Test Type: In vitro mammalian cell gene mutation test

Test system: mammalian cells

Result: positive

Remarks: (in analogy to similar products)

Carcinogenicity

Carcinogenicity - May cause cancer.

Presumed to have carcinogenic potential for humans

This is or contains a component that has been reported to be carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification. Chronic exposure to cadmium may cause lung and prostate cancer. Presumed to have carcinogenic potential for humans

NTP:	The reference note has been added by TD based on the background information of the NTP.
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OSHA:	1910.1027
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Reproductive toxicity

May damage the unborn child.

May damage fertility.

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

Oral - Causes damage to organs through prolonged or repeated exposure.
- Kidney, Bone

Aspiration hazard

No data available

Mercury(II) nitrate

Acute toxicity

Acute toxicity estimate Oral - 5.1 mg/kg
(Expert judgement)

Acute toxicity estimate Inhalation - 0.051 mg/l - dust/mist
(Expert judgement)

Acute toxicity estimate Dermal - 5.1 mg/kg
(Expert judgement)
No data available

Skin corrosion/irritation

Remarks: No data available

Serious eye damage/eye irritation

Remarks: No data available

Respiratory or skin sensitization

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

Reproductive toxicity

No data available
No data available

Specific target organ toxicity - single exposure

No data available

Specific target organ toxicity - repeated exposure

May cause damage to organs through prolonged or repeated exposure.
- Kidney

Aspiration hazard

No data available

chromium trioxide

Acute toxicity

LD50 Oral - Rat - male and female - 52 mg/kg

(OECD Test Guideline 401)

Acute toxicity estimate Inhalation - 0.051 mg/l - dust/mist

(Expert judgement)

Acute toxicity estimate Dermal - 300.1 mg/kg

(Expert judgement)

Skin corrosion/irritation

Skin - Rabbit

Result: Corrosive - 0.5 h

Remarks: (ECHA)

Serious eye damage/eye irritation

Eyes - Rabbit

Result: Causes burns.

Remarks: (ECHA)

Remarks: Causes serious eye damage.

Respiratory or skin sensitization

May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Patch test: - Human

Result: positive

Remarks: (IUCLID)

May cause an allergic skin reaction.

Germ cell mutagenicity

May cause genetic defects.

Test Type: Ames test

Result: positive

Remarks: (IUCLID)

Carcinogenicity

Carcinogenicity - Carcinogenic in animal experiments. (Lit.)

May cause cancer. Positive evidence from human epidemiological studies.

Reproductive toxicity

Suspected of damaging fertility.

Specific target organ toxicity - single exposure

May cause respiratory irritation. - Respiratory system

Specific target organ toxicity - repeated exposure

Inhalation - Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard

No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Silver nitrate:

Toxicity to fish	: LC50 (Pimephales promelas (fathead minnow)): 0.0012 mg/l End point: mortality Exposure time: 96 h Test Type: semi-static test Analytical monitoring: yes Method: US-EPA
Toxicity to daphnia and other aquatic invertebrates	: EC50 (Daphnia magna (Water flea)): 0.00022 mg/l End point: mortality Exposure time: 48 h Test Type: semi-static test Analytical monitoring: yes Remarks: (ECHA)
Toxicity to algae/aquatic plants	: ErC50 (Raphidocelis subcapitata (freshwater green alga)): 0.00252 mg/l Exposure time: 72 h Test Type: static test Analytical monitoring: yes Method: OECD Test Guideline 201 GLP: yes EC10 (Raphidocelis subcapitata (freshwater green alga)): 0.00046 mg/l Exposure time: 72 h Test Type: static test Analytical monitoring: yes Method: OECD Test Guideline 201 GLP: yes
M-Factor (Acute aquatic toxicity)	: 1,000
Toxicity to fish (Chronic toxicity)	: NOEC (Pimephales promelas (fathead minnow)): 0.000351 mg/l Exposure time: 34 d Test Type: flow-through test Analytical monitoring: yes GLP: yes Remarks: (ECHA)
Toxicity to daphnia and other aquatic invertebrates (Chronic)	: EC10 (Daphnia magna (Water flea)): 0.0027 mg/l Exposure time: 21 d Test Type: semi-static test

toxicity) Analytical monitoring: yes
Remarks: (ECHA)

M-Factor (Chronic aquatic : 100
toxicity)

Cobalt dichloride hexahydrate:

M-Factor (Acute aquatic : 10
toxicity)

Toxicity to fish (Chronic : NOEC (Pimephales promelas (fathead minnow)): 0.21
toxicity) mg/l
End point: mortality
Exposure time: 33 d
Test Type: flow-through test
Analytical monitoring: yes
GLP: yes
Remarks: (ECHA)
The value is given in analogy to the following
substances:
The value is given in analogy to the following
substances: Cobalt(II) chloride

Toxicity to daphnia and : NOEC: 0.17 mg/l
other aquatic
invertebrates (Chronic
toxicity) End point: Growth inhibition
Exposure time: 14 d
Test Type: semi-static test
Analytical monitoring: yes
GLP: yes
Remarks: (ECHA)
The value is given in analogy to the following
substances:
The value is given in analogy to the following
substances: Cobalt(II) chloride

M-Factor (Chronic aquatic : 10
toxicity)

Ecotoxicology Assessment

Acute aquatic toxicity : Very toxic to aquatic life.

Chronic aquatic toxicity : Very toxic to aquatic life with long lasting effects.

nickel(II) nitrate:

Toxicity to fish (Chronic : NOEC (Pimephales promelas (fathead minnow)):
toxicity) 0.057 mg/l
Exposure time: 32 d
Test Type: flow-through test
Analytical monitoring: yes
Remarks: (ECHA)

Toxicity to microorganisms : EC50 (Sludge Treatment): 33 mg/l
Exposure time: 30 min
Method: ISO 8192

Ecotoxicology Assessment

Acute aquatic toxicity : Very toxic to aquatic life.

Chronic aquatic toxicity : Very toxic to aquatic life with long lasting effects.

Cadmium nitrate:

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)):
0.0132 mg/l
Exposure time: 96 h
Remarks: (ECOTOX Database)
(referred to the cation)

LC50 (Ictalurus punctatus): 4.48 mg/l
Exposure time: 96 h
Test Type: flow-through test
Analytical monitoring: yes
Remarks: (ECHA)

Toxicity to daphnia and other aquatic invertebrates : LC50 (Daphnia magna (Water flea)): 0.023 mg/l
Exposure time: 48 h
Remarks: (referred to the cation)
(ECOTOX Database)

M-Factor (Acute aquatic toxicity) : 10

Toxicity to fish (Chronic toxicity) : NOEC (Pimephales promelas (fathead minnow)):
0.014 mg/l
Exposure time: 32 d
Test Type: flow-through test
Remarks: (referred to the cation)
(ECOTOX Database)

M-Factor (Chronic aquatic toxicity) : 1

Mercury(II) nitrate:

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 0.172 mg/l
Exposure time: 96.0 h

LC50 : 0.1 mg/l
Exposure time: 96 h

M-Factor (Acute aquatic toxicity) : 10

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toxicity)

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : LOEC (Daphnia magna (Water flea)): 0.0070 mg/l
Exposure time: 21 d
Test Type: mortality

LC50 (Daphnia magna (Water flea)): 0.0083 mg/l
Exposure time: 21 d

M-Factor (Chronic aquatic toxicity) : 10

chromium trioxide:

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 33.2 mg/l
Exposure time: 96 h
Analytical monitoring: yes
Remarks: (in analogy to similar products) (ECHA)

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 0.035 mg/l
Exposure time: 48 h
Analytical monitoring: yes
Remarks: (ECHA)

M-Factor (Acute aquatic toxicity) : 10

Toxicity to fish (Chronic toxicity) : NOEC (Poecilia reticulata (guppy)): 3.5 mg/l
End point: mortality
Exposure time: 28 d
Analytical monitoring: yes
Remarks: (ECHA)

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 18 mg/l
End point: mortality
Exposure time: 21 d
Analytical monitoring: yes
Remarks: (ECHA)

Ecotoxicology Assessment

Chronic aquatic toxicity : Very toxic to aquatic life with long lasting effects.

Persistence and degradability

Components:

Quartz (SiO₂):

Biodegradability : Remarks: The methods for determining the biological degradability are not applicable to inorganic

substances.

Silver nitrate:

Biodegradability : Remarks: The methods for determining the biological degradability are not applicable to inorganic substances.

nickel(II) nitrate:

Biodegradability : Remarks: The methods for determining biodegradability are not applicable to inorganic substances.

Cadmium nitrate:

Biodegradability : Remarks: The methods for determining the biological degradability are not applicable to inorganic substances.

Mercury(II) nitrate:

Biodegradability : Remarks: No data available

chromium trioxide:

Biodegradability : Remarks: The methods for determining the biological degradability are not applicable to inorganic substances.

Bioaccumulative potential

Components:

Quartz (SiO₂):

Partition coefficient: n-octanol/water : Remarks: Not applicable for inorganic substances

Silver nitrate:

Bioaccumulation : Species: Cyprinus carpio (Carp)
Bioconcentration factor (BCF): 70
Exposure time: 41 d
Temperature: 68 °F / 20 °C

Partition coefficient: n-octanol/water : Remarks: Not applicable for inorganic substances

Cobalt dichloride hexahydrate:

Partition coefficient: n-octanol/water : log Pow: 0.85
Method: (calculated)
Remarks: (Lit.)
Bioaccumulation is not expected.

nickel(II) nitrate:

Partition coefficient: n-octanol/water : Remarks: Not applicable for inorganic substances

Cadmium nitrate:

Bioaccumulation : Bioconcentration factor (BCF): 960
Exposure time: 21 d
Remarks: Can accumulate in aquatic organisms.

Partition coefficient: n-octanol/water : Remarks: Not applicable for inorganic substances

Mercury(II) nitrate:

Bioaccumulation : Remarks: No data available

chromium trioxide:

Bioaccumulation : Remarks: No data available

Partition coefficient: n-octanol/water : Remarks: Not applicable for inorganic substances

Mobility in soil**Components:****Mercury(II) nitrate:**

Stability in soil : Remarks: No data available

chromium trioxide:

Stability in soil : Remarks: No data available

Other adverse effects**Product:**

Ozone-Depletion Potential : Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances
Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

Components:**Cobalt dichloride hexahydrate:**

Additional ecological information : Discharge into the environment must be avoided.

Endocrine disrupting properties

No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself.

SECTION 14. TRANSPORT INFORMATION

International Regulations

IATA-DGR

UN/ID No. : UN 3077
Proper shipping name : Environmentally hazardous substance, solid, n.o.s. (Silver nitrate)
Class : 9
Packing group : III
Labels : Class 9 - Miscellaneous dangerous substances and articles
Packing instruction (cargo : 956
aircraft)
Packing instruction : 956
(passenger aircraft)

IMDG-Code

UN number : UN 3077
Proper shipping name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Silver nitrate)
Class : 9
Packing group : III
Labels : 9
EmS Code : F-A, S-F
Marine pollutant : yes

Transport in bulk according to IMO instruments

Not applicable for product as supplied.

National Regulations

49 CFR

UN/ID/NA number : UN 3077
Proper shipping name : Environmentally hazardous substance, solid, n.o.s. (Silver nitrate)
Class : 9

Packing group	: III
Labels	: Class 9 - Miscellaneous dangerous substances and articles
ERG Code	: 171
Marine pollutant	: no
Poison Inhalation Hazard	: No

Special precautions for user

Remarks : EHS-Mark required (ADR 2.2.9.1.10, IMDG code 2.10.3) for single packagings and combination packagings containing inner packagings with Dangerous Goods > 5L for liquids or > 5kg for solids.

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Silver nitrate	7761-88-8	1	4016
Arsenic trioxide	1327-53-3	1	4016

SARA 304 Extremely Hazardous Substances Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Arsenic trioxide	1327-53-3	1	4016

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Chronic Health Hazard

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

Mercury(II) nitrate	10045-94-0	< 0.1 %
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Clean Air Act

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCM I Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

The following Hazardous Substances are listed under the U.S. CleanWater Act, Section 311, Table 116.4A:

Silver nitrate	7761-88-8	>= 0 - < 0.1 %
Mercury(II) nitrate	10045-94-0	>= 0 - < 0.1 %
vanadium pentoxide	1314-62-1	>= 0 - < 0.1 %
Arsenic trioxide	1327-53-3	>= 0 - < 0.1 %
Potassium	28300-74-5	>= 0 - < 0.1 %
antimony(III) oxide		
tartrate trihydrate		
Thallic sulphate	7446-18-6	>= 0 - < 0.1 %
Tetraethyllead	78-00-2	>= 0 - < 0.1 %

The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:

Silver nitrate	7761-88-8	>= 0 - < 0.1 %
nickel(II) nitrate	13138-45-9	>= 0 - < 0.1 %
Mercury(II) nitrate	10045-94-0	>= 0 - < 0.1 %
vanadium pentoxide	1314-62-1	>= 0 - < 0.1 %
Arsenic trioxide	1327-53-3	>= 0 - < 0.1 %
Potassium	28300-74-5	>= 0 - < 0.1 %
antimony(III) oxide		
tartrate trihydrate		
Tetraethyllead	78-00-2	>= 0 - < 0.1 %

This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307

This product does not contain any priority pollutants related to the U.S. Clean Water Act

US State Regulations

Massachusetts Right To Know

Quartz (SiO ₂)	14808-60-7
Selenious acid	7783-00-8
vanadium pentoxide	1314-62-1
Arsenic trioxide	1327-53-3
chromium trioxide	1333-82-0
Thallic sulphate	7446-18-6
Tetraethyllead	78-00-2

Pennsylvania Right To Know

Quartz (SiO ₂)	14808-60-7
Silver nitrate	7761-88-8
Cobalt dichloride hexahydrate	7791-13-1
Barium nitrate	10022-31-8
nickel(II) nitrate	13138-45-9
Cadmium nitrate	10325-94-7
Selenious acid	7783-00-8
Mercury(II) nitrate	10045-94-0
Copper dinitrate	10402-29-6
molybdenum(VI) oxide	1313-27-5
Zinc oxide	1314-13-2

vanadium pentoxide	1314-62-1
Arsenic trioxide	1327-53-3
chromium trioxide	1333-82-0
Potassium antimony(III) oxide tartrate trihydrate	28300-74-5
Thallic sulphate	7446-18-6
Beryllium acetate	543-81-7
Tetraethyllead	78-00-2

Maine Chemicals of High Concern

Quartz (SiO ₂)	14808-60-7
nickel(II) nitrate	13138-45-9

Vermont Chemicals of High Concern

Cobalt dichloride hexahydrate	7791-13-1
Cadmium nitrate	10325-94-7
ammonium molybdate(VI)	13106-76-8
Mercury(II) nitrate	10045-94-0
molybdenum(VI) oxide	1313-27-5
Arsenic trioxide	1327-53-3
Potassium antimony(III) oxide tartrate trihydrate	28300-74-5
Tetraethyllead	78-00-2

Washington Chemicals of High Concern

Cobalt dichloride hexahydrate	7791-13-1
Cadmium nitrate	10325-94-7
Mercury(II) nitrate	10045-94-0
Arsenic trioxide	1327-53-3
Potassium antimony(III) oxide tartrate trihydrate	28300-74-5

California Prop. 65

WARNING: This product can expose you to chemicals including nickel(II) nitrate, molybdenum(VI) oxide, vanadium pentoxide, Arsenic trioxide, chromium trioxide, Beryllium acetate, Tetraethyllead, which is/are known to the State of California to cause cancer, and nickel(II) nitrate, Mercury(II) nitrate, Arsenic trioxide, chromium trioxide, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov. **The components of this product are reported in the following inventories:**

US TSCA : Product contains substance(s) not listed on TSCA inventory.

TSCA list

No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

SECTION 16. OTHER INFORMATION

Full text of other abbreviations

ACGIH : USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI : ACGIH - Biological Exposure Indices (BEI)

Sigma-Aldrich - SQC005

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The life science business of Merck KGaA, Darmstadt, Germany operates as MilliporeSigma in the US and Canada

**MILLIPORE
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NIOSH REL	: USA. NIOSH Recommended Exposure Limits
OSHA CARC	: OSHA Specifically Regulated Chemicals/Carcinogens
OSHA Z-1	: USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
OSHA Z-3	: USA. Occupational Exposure Limits (OSHA) - Table Z-3 Mineral Dusts
ACGIH / TWA	: 8-hour, time-weighted average
ACGIH / STEL	: Short-term exposure limit
NIOSH REL / TWA	: Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
NIOSH REL / C	: Ceiling value not be exceeded at any time.
OSHA CARC / PEL	: Permissible exposure limit (PEL)
OSHA Z-1 / TWA	: 8-hour time weighted average
OSHA Z-3 / TWA	: 8-hour time weighted average

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonised System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organisation; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardisation; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organisation for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is

applicable to appropriate safety precautions for the product. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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