

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended by Commission Regulation (EU) 2020/878

Version 7.4
Revision Date 20.05.2026
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GENERIC EU MSDS - NO COUNTRY SPECIFIC DATA - NO OEL DATA

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Iron(III) chloride anhydrous for synthesis

Product Number : 8.03945

Catalogue No. : 803945

Brand : Millipore

REACH No. : 01-2119497998-05-XXXX

CAS-No. : 7705-08-0

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

Identified uses : Chemical for synthesis

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Chemie GmbH
Eschenstrasse 5
D-82024 TAUFKIRCHEN

Telephone : +49 (0)89 6513-1130

Fax : +49 (0)89 6513-1161

E-mail address : technischerservice@merckgroup.com

1.4 Emergency telephone number

Emergency Phone # : 0800 181 7059 (CHEMTREC Deutschland)
+49 (0)696 43508409 (CHEMTREC weltweit)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Corrosive to metals, Category 1	H290: May be corrosive to metals.
Acute toxicity, Category 4	H302: Harmful if swallowed.
Skin irritation, Category 2	H315: Causes skin irritation.
Serious eye damage, Category 1	H318: Causes serious eye damage.



2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms

:



Signal word

: Danger

Hazard statements

: H290 May be corrosive to metals.
 H302 Harmful if swallowed.
 H315 Causes skin irritation.
 H317 May cause an allergic skin reaction.
 H318 Causes serious eye damage.

Precautionary statements

:

Prevention:

P234 Keep only in original packaging.
 P261 Avoid breathing dust.
 P280 Wear protective gloves/ eye protection/ face protection.

Response:

P301 + P312 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell.
 P302 + P352 IF ON SKIN: Wash with plenty of water.
 P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Reduced Labelling (<= 125 ml)

Hazard pictograms

:



Signal word

Danger

Hazard Statements

H317 May cause an allergic skin reaction.
 H318 Causes serious eye damage.

Precautionary Statements

P261 Avoid breathing dust.
 P280 Wear protective gloves/ eye protection/ face protection.
 P302 + P352 IF ON SKIN: Wash with plenty of water.
 P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue



	rinsing.
Supplemental Hazard Statements	none

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Ecological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Toxicological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.1 Substances

EC-No. : 231-729-4

Components

Chemical name	CAS-No. EC-No.	Concentration (%) w/w)	M-Factor, SCL, ATE
iron(III) chloride	7705-08-0 231-729-4	$\geq 90 - \leq 100$	specific concentration limit Met. Corr. 1; H290 $\geq 1\%$ Acute toxicity estimate Acute oral toxicity: 1.300 mg/kg
zinc chloride	7646-85-7 231-592-0	$\geq 0,1 - < 0,25$	M-Factor (Acute aquatic toxicity): 10 M-Factor (Chronic aquatic toxicity): 1 specific concentration limit STOT SE 3; H335 $\geq 5\%$



			Acute toxicity estimate Acute oral toxicity: 1.100 mg/kg
chromium(III) chloride	10025-73-7 233-038-3	$\geq 0,1 - < 0,25$	
nickel(II) chloride	7718-54-9 231-743-0	$\geq 0,025 - < 0,1$	M-Factor (Acute aquatic toxicity): 1 M-Factor (Chronic aquatic toxicity): 1 _____ specific concentration limit STOT RE 1; H372 $\geq 1 \%$ _____ STOT RE 2; H373 $0,1 - < 1 \%$ _____ Skin Irrit. 2; H315 $\geq 20 \%$ _____ Skin Sens. 1; H317 $\geq 0,01 \%$

SECTION 4: First aid measures

4.1 Description of first aid measures

- General advice : Show this safety data sheet to the doctor in attendance.
- If inhaled : After inhalation: fresh air.
- 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. Immediately call in ophthalmologist. Remove contact lenses.
- If swallowed : After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.



4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Unsuitable extinguishing media : Water
Foam

5.2 Special hazards arising from the substance or mixture

Specific hazards during fire fighting : Not combustible.

Caution! in contact with water product releases:
hydrochloric acid

Fire may cause evolution of:

Hydrogen chloride gas

Ambient fire may liberate hazardous vapours.

Hazardous combustion products : Hydrogen chloride gas

Iron oxides

5.3 Advice for firefighters

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.

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.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Advice for non-emergency personnel:
Avoid inhalation of dusts.
Avoid substance contact.
Ensure adequate ventilation.
Evacuate the danger area, observe emergency procedures, consult an expert.

For personal protection see section 8.

6.2 Environmental precautions

Environmental precautions : Do not let product enter drains.



6.3 Methods and material for containment and cleaning up

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

6.4 Reference to other sections

For disposal considerations see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling : Keep workplace dry. Do not allow product to come into contact with water.

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

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage : No metal containers.
areas and containers

Further information on : Tightly closed. Dry.
storage conditions

Storage class (TRGS 510) : 13, Non Combustible Solids

Further information on : Recommended storage temperature see product label.
storage stability

Recommended storage : Recommended storage temperature see product label.
temperature

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006

Substance name	End Use	Exposure routes	Potential health effects	Value
iron(III) chloride	Worker DNEL _r	Inhalation	Systemic effects	2 mg/m ³



	longterm			
	Worker DNEL, longterm	Dermal	Systemic effects	0,57 mg/kg
	Worker DNEL, acute	Inhalation	Systemic effects	2 mg/m3
	Worker DNEL, acute	Dermal	Systemic effects	0,57 mg/kg
	Consumer DNEL, longterm	Inhalation	Systemic effects	0,5 mg/m3
	Consumer DNEL, longterm	Dermal	Systemic effects	0,29 mg/kg
	Consumer DNEL, longterm	Oral	Systemic effects	0,29 mg/kg
	Consumer DNEL, acute	Inhalation	Systemic effects	0,5 mg/m3
	Consumer DNEL, acute	Dermal	Systemic effects	0,29 mg/kg
	Consumer DNEL, acute	Oral	Systemic effects	0,29 mg/kg
zinc chloride	Worker DNEL, longterm	Inhalation	Systemic effects	1 mg/m3
	Remarks: Zinc			
	Worker DNEL, longterm	Dermal	Systemic effects	8,3 mg/kg
	Remarks: Zinc			
	Consumer DNEL, longterm	Inhalation	Systemic effects	1,3 mg/m3
	Remarks: Zinc			
	Consumer DNEL, longterm	Dermal	Systemic effects	8,3 mg/kg
	Remarks: Zinc			
	Consumer DNEL, longterm	Oral	Systemic effects	0,83 mg/kg
	Remarks: Zinc			

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006

Substance name	Environmental Compartment	Value
	Fresh water sediment	49,5 mg/kg
	Remarks: as Fe	
	Marine water	49,5 mg/kg
	Remarks: as Fe	
	Sewage treatment plant	500 mg/l
	Remarks: as Fe	



	Soil	55,5 mg/kg
	Remarks: as Fe	

8.2 Exposure controls

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection : Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).
Tightly fitting safety goggles

Hand protection

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 : 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).

Skin and body protection : protective clothing

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 B-(P2)

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.

Environmental exposure controls

Advice : Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state : solid

Millipore- 8.03945

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The life science business of Merck operates as MilliporeSigma in the US and Canada



Form	: powder
Color	: green, to, black
Odor	: pungent
Melting point/ range	: 306 °C (ECHA)
Boiling point/boiling range	: Decomposes below the boiling point.
Flammability	: does not ignite Method: A.10. (Regulation (EC) No 440/2008, Annex A) GLP: yes
Upper explosion limit / Upper flammability limit	: No data available
Lower explosion limit / Lower flammability limit	: No data available
Flash point	: Not applicable
Autoignition temperature	: not combustible
Decomposition temperature	: 316 °C
pH	: No data available
Viscosity, dynamic	: No data available
Viscosity, kinematic	: No data available
Flow time	: No data available
Solubility(ies) Water solubility	: soluble
Partition coefficient: n- octanol/water	: Not applicable for inorganic substances



Vapor pressure	: < 1 hPa (20 °C)
Relative density	: 2,89 (25 °C)
Density	: 2,800 g/cm ³ (25 °C)
Bulk density	: ca. 1.000 kg/m ³
Relative vapour density	: 5,60 (Air = 1.0)

9.2 Other information

Explosives	: Not classified as explosive.
Oxidizing properties	: none
Burning rate	: No data available
Metal corrosion rate	: May be corrosive to metals.
Evaporation rate	: No data available
Molecular weight	: 162,21 g/mol

SECTION 10: Stability and reactivity

10.1 Reactivity

No data available

10.2 Chemical stability

The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions

Hazardous reactions	: Risk of explosion with:
	Alkali metals
	Ethylene oxide
	Violent reactions possible with:
	Aluminium



with
Heat
Copper
metals
Light metals
Generates dangerous gases or fumes in contact with:

Water

10.4 Conditions to avoid

Conditions to avoid : no information available

10.5 Incompatible materials

No data available

10.6 Hazardous decomposition products

In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Acute toxicity estimate Oral - 1.300 mg/kg
(Calculation method)

LD50 Oral - Mouse - female - 1.300 mg/kg

Remarks: (ECHA)

Acute toxicity estimate Oral - 1.300 mg/kg
(ATE value derived from LD50/LC50 value)

Inhalation: No data available

LD50 Dermal - Rat - male and female - > 2.000 mg/kg
(OECD Test Guideline 402)

Remarks: (in analogy to similar products)

The value is given in analogy to the following substances: iron dichloride

Skin corrosion/irritation

Skin - Rabbit

Result: Irritating to skin. - 4 h
(OECD Test Guideline 404)

Remarks: (in analogy to similar products)

The value is given in analogy to the following substances: Ferrous sulfate heptahydrate
The value is given in analogy to the following substances: Iron(II) sulphate

Serious eye damage/eye irritation

Eyes - Rabbit

Result: Causes serious eye damage.
(OECD Test Guideline 405)

Remarks: (in analogy to similar products)

The value is given in analogy to the following substances: iron dichloride

Respiratory or skin sensitization

Local lymph node assay (LLNA) - Mouse



Result: negative
(OECD Test Guideline 429)
Remarks: (in analogy to similar products)

Germ cell mutagenicity

Test Type: In vitro mammalian cell gene mutation test
Test system: mouse lymphoma cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative
The value is given in analogy to the following substances: Ferrous sulfate heptahydrate
Test Type: Mutagenicity (mammal cell test): micronucleus.
Test system: Chinese hamster lung cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 487
Result: negative
Test Type: Ames test
Test system: Escherichia coli/Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Test Type: In vivo micronucleus test
Species: Mouse

Application Route: Oral

Result: negative
Remarks: (ECHA)

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

11.2 Additional Information

Endocrine disrupting properties

Product:

Assessment

The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, Overdose of iron compounds may have a



corrosive effect on the gastrointestinal mucosa and be followed by necrosis, perforation, and stricture formation. Several hours may elapse before symptoms that can include epigastric pain, diarrhea, vomiting, nausea, and hematemesis occur. After apparent recovery a person may experience metabolic acidosis, convulsions, and coma hours or days later. Further complications may develop leading to acute liver necrosis that can result in death due to hepatic coma.

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

SECTION 12: Ecological information

12.1 Toxicity

Components:

iron(III) chloride:

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 9,6 mg/l
Exposure time: 48 h
Test Type: Immobilization
Method: OECD Test Guideline 202

Ecotoxicology Assessment

Chronic aquatic toxicity : This product has no known ecotoxicological effects.

zinc chloride:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 0,169 mg/l
End point: mortality
Exposure time: 96 h
Test Type: static test
Remarks: (ECHA)

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 0,33 mg/l
Exposure time: 48 h
Test Type: static test
Analytical monitoring: yes
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : NOEC (Pseudokirchneriella subcapitata (green algae)): 0,0049 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Method: OECD Test Guideline 201

M-Factor (Acute aquatic toxicity) : 10

Toxicity to microorganisms : IC50 (activated sludge): 0,35 mg/l
Exposure time: 4 h
Test Type: static test



Method: ISO 9509
Remarks: (referred to the cation)

Toxicity to fish (Chronic toxicity) : NOEC: 0,039 mg/l
Exposure time: 30 d
Species: Oncorhynchus mykiss (rainbow trout)
Test Type: flow-through test
Analytical monitoring: yes
Method: OECD Test Guideline 215

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 0,039 mg/l
End point: reproduction rate
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Test Type: semi-static test
Analytical monitoring: yes
Method: OECD Test Guideline 211

M-Factor (Chronic aquatic toxicity) : 1

chromium(III) chloride:

Toxicity to fish : LC50 (Fundulus heteroclitus): 31,5 mg/l
Exposure time: 96 h
Test Type: static test
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 9,87 mg/l
Exposure time: 48 h
Test Type: static test
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EC50 (Algae): 7,5 mg/l
Exposure time: 96 h

nickel(II) chloride:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 15,3 mg/l
End point: mortality
Exposure time: 96 h
Test Type: semi-static test
Analytical monitoring: yes
Remarks: (ECHA)

Toxicity to daphnia and other aquatic invertebrates : LC50 (Ceriodaphnia dubia (water flea)): 0,013 mg/l
End point: mortality
Exposure time: 48 h
Test Type: static test
Analytical monitoring: yes
Remarks: (ECHA)

Toxicity to algae/aquatic : ErC50 (green algae): 0,243 mg/l



plants	Exposure time: 72 h Test Type: static test Analytical monitoring: yes Method: OECD Test Guideline 201
M-Factor (Acute aquatic toxicity)	: 1
Toxicity to fish (Chronic toxicity)	: LC50: 27,8 mg/l End point: mortality Exposure time: 28 d Species: Cyprinodon variegatus (sheepshead minnow) Test Type: flow-through test Analytical monitoring: yes GLP: yes Remarks: (ECHA)
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	: NOEC: 0,029 mg/l End point: mortality Exposure time: 14 d Species: Hyalella azteca (Amphipod) Test Type: semi-static test Analytical monitoring: yes Remarks: (ECHA)
M-Factor (Chronic aquatic toxicity)	: 1

12.2 Persistence and degradability

Components:

iron(III) chloride:

Biodegradability : Result: Readily biodegradable.

zinc chloride:

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

chromium(III) chloride:

Biodegradability : Remarks: No data available

nickel(II) chloride:

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



12.3 Bioaccumulative potential

Components:

iron(III) chloride:

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

zinc chloride:

Bioaccumulation : Species: Channa punctata
Exposure time: 45 d
Temperature: 27 °C
Bioconcentration factor (BCF): 0,4

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

chromium(III) chloride:

Bioaccumulation : Remarks: No data available

nickel(II) chloride:

Bioaccumulation : Species: Oncorhynchus mykiss (rainbow trout)
Exposure time: 180 d
Concentration: 1000 µg/l
Bioconcentration factor (BCF): 4

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

12.4 Mobility in soil

Components:

chromium(III) chloride:

Stability in soil : Remarks: No data available

12.5 Results of PBT and vPvB assessment

Product:

Assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Components:

iron(III) chloride:

Assessment : Substance does not meet the criteria for PBT or vPvB according to Regulation (EC) No 1907/2006, Annex XIII.



zinc chloride:

Assessment : PBT/vPvB: Not applicable for inorganic substances

12.6 Endocrine disrupting properties**Product:**

Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects**Components:****chromium(III) chloride:**

Additional ecological information : Toxic to aquatic life with long lasting effects.

nickel(II) chloride:

Additional ecological information : Very toxic to aquatic life with long lasting effects.

Discharge into the environment must be avoided.

SECTION 13: Disposal considerations**13.1 Waste treatment methods**

Product : 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**14.1 UN number or ID number**

ADR : UN 1773

IMDG : UN 1773

IATA : UN 1773

14.2 UN proper shipping name

ADR : FERRIC CHLORIDE, ANHYDROUS

IMDG : FERRIC CHLORIDE, ANHYDROUS

IATA : Ferric chloride, anhydrous



14.3 Transport hazard class(es)

	Class	Subsidiary risks
ADR	: 8	
IMDG	: 8	
IATA	: 8	

14.4 Packing group

ADR

Packing group	: III
Classification Code	: C2
Hazard Identification Number	: 80
Labels	: 8
Tunnel restriction code	: (E)

IMDG

Packing group	: III
Labels	: 8
EmS Code	: F-A, S-B

IATA (Cargo)

Packing instruction (cargo aircraft)	: 864
Packing instruction (LQ)	: Y845
Packing group	: III
Labels	: Class 8 - Corrosive substances

IATA_P (Passenger)

Packing instruction (passenger aircraft)	: 860
Packing instruction (LQ)	: Y845
Packing group	: III
Labels	: Class 8 - Corrosive substances

14.5 Environmental hazards

ADR

Environmentally hazardous	: yes
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IMDG

Marine pollutant	: yes
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14.6 Special precautions for user

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.

14.7 Maritime transport in bulk according to IMO instruments

Not applicable for product as supplied.



SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII)	: Conditions of restriction for the following entries should be considered: Number on list 27: nickel(II) chloride Number on list 75 If you intend to use this product as tattoo ink, please contact your vendor.
REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59).	: Not applicable
Regulation (EU) No 2024/590 on substances that deplete the ozone layer	: Not applicable
Regulation (EU) 2019/1021 on persistent organic pollutants (recast)	: Not applicable
REACH - List of substances subject to authorisation (Annex XIV)	: Not applicable
Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.	Not applicable

15.2 Chemical safety assessment

A Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Full text of H-Statements

H290	: May be corrosive to metals.
H315	: Causes skin irritation.
H317	: May cause an allergic skin reaction.
H335	: May cause respiratory irritation.
H372	: Causes damage to organs through prolonged or repeated exposure.
H373	: May cause damage to organs through prolonged or repeated exposure.
H290	: May be corrosive to metals.
H315	: Causes skin irritation.

Full text of other abbreviations



Acute Tox.	: Acute toxicity
Aquatic Acute	: Short-term (acute) aquatic hazard
Aquatic Chronic	: Long-term (chronic) aquatic hazard
Carc.	: Carcinogenicity
Eye Dam.	: Serious eye damage
Met. Corr.	: Corrosive to metals
Muta.	: Germ cell mutagenicity
Repr.	: Reproductive toxicity
Resp. Sens.	: Respiratory sensitisation
Skin Corr.	: Skin corrosion
Skin Irrit.	: Skin irritation
Skin Sens.	: Skin sensitisation
STOT RE	: Specific target organ toxicity - repeated exposure
STOT SE	: Specific target organ toxicity - single exposure
Met. Corr.	: Corrosive to metals
STOT SE	: Specific target organ toxicity - single exposure
STOT RE	: Specific target organ toxicity - repeated exposure
Skin Irrit.	: Skin irritation
Skin Sens.	: Skin sensitisation

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; 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; GHS - Globally Harmonised System; GLP - Good Laboratory Practice; 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; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; 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; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; SVHC - Substance of Very High Concern; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances



Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

Further information

Other information : 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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REG_EU / EN



Annex: Exposure scenario

Identified uses:

Use: Industrial use

SU 3: Industrial uses: Uses of substances as such or in preparations at industrial sites
SU 3, SU 10: Industrial uses: Uses of substances as such or in preparations at industrial sites, Formulation [mixing] of preparations and/ or re-packaging (excluding alloys)
PC19: Intermediate
PC39: Cosmetics, personal care products
PROC1: Use in closed process, no likelihood of exposure
PROC2: Use in closed, continuous process with occasional controlled exposure
PROC3: Use in closed batch process (synthesis or formulation)
PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises
PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/ or significant contact)
PROC8a: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities
PROC8b: Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC14: Production of preparations or articles by tableting, compression, extrusion, pelletisation
PROC15: Use as laboratory reagent
PROC22: Potentially closed processing operations with minerals/ metals at elevated temperature; Industrial setting
PROC26: Handling of solid inorganic substances at ambient temperature
ERC1, ERC2, ERC4, ERC6a, ERC6b: Manufacture of substances, Formulation of preparations, Industrial use of processing aids in processes and products, not becoming part of articles, Industrial use resulting in manufacture of another substance (use of intermediates), Industrial use of reactive processing aids

Use: Professional use

SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
SU 22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
PC39: Cosmetics, personal care products
ERC8a, ERC8d: Wide dispersive indoor use of processing aids in open systems, Wide dispersive outdoor use of processing aids in open systems

Use: Consumer use

SU 21: Consumer uses: Private households (= general public = consumers)
SU 21: Consumer uses: Private households (= general public = consumers)
PC39: Cosmetics, personal care products
ERC8a, ERC8d: Wide dispersive indoor use of processing aids in open systems, Wide dispersive outdoor use of processing aids in open systems



1. Short title of Exposure Scenario: Industrial use

Main User Groups	: SU 3
Sectors of end-use	: SU 3, SU 10
Chemical product category	: PC19, PC39
Process categories	: PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC14, PROC15, PROC22, PROC26
Environmental Release Categories	: ERC1, ERC2, ERC4, ERC6a, ERC6b:

2.2 Contributing scenario controlling worker exposure for: PROC1, PROC2, PROC3, PROC8b

Product characteristics

Concentration of the Substance in Mixture/Article	: Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	: Solid, low dustiness
Physical Form (at time of use)	: Aqueous solution

Frequency and duration of use

Frequency of use	: 8 hours/day
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Other operational conditions affecting workers exposure

Outdoor / Indoor	: Indoor
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Organisational measures to prevent /limit releases, dispersion and exposure

Regular cleaning of equipment, work area and clothing., Enclosed process

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374), coverall and eye protection.

2.2 Contributing scenario controlling worker exposure for: PROC4, PROC5, PROC8a, PROC9, PROC14, PROC15, PROC22, PROC26

Product characteristics

Concentration of the Substance in Mixture/Article	: Covers the percentage of the substance in the product up to 100 % (unless stated differently).
Physical Form (at time of use)	: Solid, low dustiness
Physical Form (at time of use)	: Aqueous solution

Frequency and duration of use

Frequency of use	: 8 hours/day
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Other operational conditions affecting workers exposure

Outdoor / Indoor	: Indoor
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Technical conditions and measures

Ensure material transfers are under containment or extract ventilation.

Organisational measures to prevent /limit releases, dispersion and exposure



Regular cleaning of equipment, work area and clothing.

Conditions and measures related to personal protection, hygiene and health evaluation

Wear suitable gloves (tested to EN374), coverall and eye protection.

3. Exposure estimation and reference to its source

Environment

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

Workers

Contributing Scenario	Exposure Assessment Method	Specific conditions	Value	Level of Exposure	RCR*
PROC1	ECETOC TRA, Stoffenmanager	longterm, combined, systemic			< 1
PROC2	ECETOC TRA, Stoffenmanager	longterm, combined, systemic			< 1
PROC3	ECETOC TRA, Stoffenmanager	longterm, combined, systemic			< 1
PROC8b	ECETOC TRA, Stoffenmanager	longterm, combined, systemic			< 1

*Risk characterisation ratio

PROC4	ECETOC TRA, Stoffenmanager	longterm, combined, systemic			< 1
PROC5	ECETOC TRA	longterm, combined, systemic			< 1
ERC8a	ECETOC TRA	longterm, combined, systemic			< 1
PROC9	ECETOC TRA	longterm, combined, systemic			< 1
PROC14	ECETOC TRA	longterm, combined, systemic			< 1
PROC15	ECETOC TRA	longterm, combined, systemic			< 1
PROC22	ECETOC TRA	longterm,			< 1



		combined, systemic			
PROC26	ECETOC TRA	longterm, combined, systemic			< 1

*Risk characterisation ratio

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Please refer to the following documents: ECHA Guidance on information requirements and chemical safety assessment Chapter R.12: Use descriptor system; ECHA Guidance for downstream users; ECHA Guidance on information requirements and chemical safety assessment Part D: Exposure Scenario Building, Part E: Risk Characterisation and Part G: Extending the SDS; VCI/Cefic REACH Practical Guides on Exposure Assessment and Communications in the Supply Chain; CEFIC Guidance Specific Environmental Release Categories (SPERCs).

1. Short title of Exposure Scenario: Professional use

Main User Groups : **SU 22**
 Sectors of end-use : **SU 22**
 Chemical product category : **PC39**
 Environmental Release Categories : **ERC8a, ERC8d:**

3. Exposure estimation and reference to its source

Environment

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Please refer to the following documents: ECHA Guidance on information requirements and chemical safety assessment Chapter R.12: Use descriptor system; ECHA Guidance for downstream users; ECHA Guidance on information requirements and chemical safety assessment Part D: Exposure Scenario Building, Part E: Risk Characterisation and Part G: Extending the SDS; VCI/Cefic REACH Practical Guides on Exposure Assessment and Communications in the Supply Chain; CEFIC Guidance Specific Environmental Release Categories (SPERCs).



1. Short title of Exposure Scenario: Consumer use

Main User Groups : **SU 21**
Sectors of end-use : **SU 21**
Chemical product category : **PC39**
Environmental Release Categories : **ERC8a, ERC8d:**

3. Exposure estimation and reference to its source

Environment

A chemical safety assessment was performed according REACH Article 14(3), Annex I, sections 3 (Environmental Hazard assessment) and 4 (PBT/vPvB Assessment). As no hazard was identified, an exposure assessment and risk characterisation is not necessary (REACH Annex I section 5.0).

4. Guidance to Downstream User to evaluate whether he works inside the boundaries set by the Exposure Scenario

Please refer to the following documents: ECHA Guidance on information requirements and chemical safety assessment Chapter R.12: Use descriptor system; ECHA Guidance for downstream users; ECHA Guidance on information requirements and chemical safety assessment Part D: Exposure Scenario Building, Part E: Risk Characterisation and Part G: Extending the SDS; VCI/Cefic REACH Practical Guides on Exposure Assessment and Communications in the Supply Chain; CEFIC Guidance Specific Environmental Release Categories (SPERCs).

