



# SAFETY DATA SHEET

Conforms to Regulation (EC) No. 1907/2006 (REACH), Annex II, as amended by UK REACH Regulation SI 2019/758

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

### 1.1 Product identifier

Product name

**CDM4PERMAB™ Recommended additions:  
3.2 g/L Sodium Bicarbonate, 0.5 g/L  
Poloxamer 188, 4 mM L-Glutamine**

Catalogue Number

SH30872.01



9 0 S H 3 0 8 7 2 . 0 1

Product description Not available.

Product type Powder.

Other means of identification Not available.

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

For Further Manufacturing or Research Use. Not for Diagnostic or Therapeutic Use.

### 1.3 Details of the supplier of the safety data sheet

#### Supplier

Cytiva Austria  
Kremplstr. 5  
4061 Pasching  
AUSTRIA  
Phone: +43 7229 64865

**Hours of operation**  
Mo. - Fr.  
08.30 - 17.00

HyClone Laboratories  
925 West 1800 South  
Logan, Utah 84321  
Phone: (435) 792-8000

Cytiva Singapore  
1 Maritime Square #13-01  
Harbourfront Centre  
Singapore 099253

Person who prepared the SDS: sds\_author@cytiva.com

### 1.4 Emergency telephone number

#### **United Kingdom (UK)**

Cytiva Austria  
Kremplstr. 5  
4061 Pasching  
AUSTRIA  
Phone: +43 7229 64865

Call INFOTRAC 24 Hour number:  
001-352-323-3500 (Call Collect).

### National advisory body/Poison Centre

#### **United Kingdom (UK)**

National Poison Information Centre  
Medical Toxicology Unit  
Avalonley Road  
London SE14 5ER  
Tel.: +44 (171)635 91 91

## SECTION 2: Hazards identification

### 2.1 Classification of the substance or mixture

**Product definition** Mixture

#### Classification according to UK CLP/GHS

Aquatic Chronic 3, H412

The product is classified as hazardous according to UK CLP Regulation SI 2019/720 as amended.

**Ingredients of unknown toxicity** 30.2 percent of the mixture consists of component(s) of unknown acute oral toxicity  
73.2 percent of the mixture consists of component(s) of unknown acute dermal toxicity  
78.2 percent of the mixture consists of component(s) of unknown acute inhalation toxicity

**Ingredients of unknown ecotoxicity** Contains 44% of components with unknown hazards to the aquatic environment

See Section 16 for the full text of the H statements declared above.

See Section 11 for more detailed information on health effects and symptoms.

### 2.2 Label elements

#### Hazard pictograms

**Signal word** No signal word.

**Hazard statements** Harmful to aquatic life with long lasting effects.

#### Precautionary statements

**General** Not applicable.

**Prevention** Avoid release to the environment.

**Response** Not applicable.

**Storage** Not applicable.

**Disposal** Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Supplemental label elements** Not applicable.

**Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles** Not applicable.

#### Special packaging requirements

**Containers to be fitted with child-resistant fastenings** Not applicable.

**Tactile warning of danger** Not applicable.

### 2.3 Other hazards

Product meets the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII

This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

**Other hazards which do not result in classification** May form explosive dust-air mixture if dispersed.

## SECTION 3: Composition/information on ingredients

**3.2 Mixtures** Mixture

Product/ingredient name	Identifiers	%	Classification	Type
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188, 4 mM L-Glutamine				
ammonium iron(III) citrate	EC: 214-686-6 CAS: 1185-57-5	<0.85	Not classified.	[2]
ethanol	REACH #: 01-2119457610-43 EC: 200-578-6 CAS: 64-17-5 Index: 603-002-00-5	<0.4	Flam. Liq. 2, H225	[1] [2]
copper sulphate pentahydrate	EC: 231-847-6 CAS: 7758-99-8 Index: 029-023-00-4	<0.02	Acute Tox. 4, H302 Eye Dam. 1, H318 Aquatic Acute 1, H400 (M=1) Aquatic Chronic 1, H410 (M=1)	[1] [2]
Copper chloride (CuCl <sub>2</sub> ), dihydrate	EC: 231-210-2 CAS: 10125-13-0	<0.005	Aquatic Acute 1, H400 (M=100) Aquatic Chronic 1, H410 (M=100)	[1] [2]
Acetic acid.	REACH #: 01-2119475328-30 EC: 200-580-7 CAS: 64-19-7 Index: 607-002-00-6	<0.0007	Flam. Liq. 3, H226 Acute Tox. 4, H312 Acute Tox. 4, H332 Skin Corr. 1A, H314 Eye Dam. 1, H318	[1] [2]
sodium selenite	EC: 233-267-9 CAS: 10102-18-8 Index: 034-003-00-3	<0.00009675	Acute Tox. 2, H300 Acute Tox. 3, H331 Skin Sens. 1, H317 Aquatic Acute 1, H400 (M=100) Aquatic Chronic 2, H411 EUH031	[1] [2]
Molybdate (Mo <sub>7</sub> O <sub>24</sub> 6-), ammonium, hydrate (1:6:4)	EC: 234-722-4 CAS: 12054-85-2	<0.0000455	Aquatic Chronic 3, H412	[1] [2]
Cobalt dichloride, hexahydrate	EC: 231-589-4 CAS: 7791-13-1 Index: 027-004-00-5	<0.0000195	Acute Tox. 4, H302 Resp. Sens. 1, H334 Skin Sens. 1, H317 Muta. 2, H341 Carc. 1B, H350i Repr. 1B, H360F Aquatic Acute 1, H400 (M=10) Aquatic Chronic 1, H410 (M=10)	[1] [2] [4]
Copper chloride (CuCl <sub>2</sub> ), dihydrate	EC: 231-210-2 CAS: 10125-13-0	<0.000013	Aquatic Acute 1, H400 (M=100) Aquatic Chronic 1, H410 (M=100)	[1] [2]
Sulfuric acid, manganese(2+) salt, hydrate (1:1:1)	EC: 232-089-9 CAS: 10034-96-5 Index: 025-003-00-4	<0.00000585	STOT RE 2, H373 Aquatic Chronic 2, H411	[1] [2]
Cadmium chloride, hydrate (2:5)	EC: 233-296-7 CAS: 7790-78-5 Index: 048-008-00-3	0.0000013 - 0.00000325	Acute Tox. 3, H301 Acute Tox. 2, H330 Muta. 1B, H340 Carc. 1B, H350 Repr. 1B, H360FD STOT RE 1, H372 Aquatic Acute 1, H400 (M=1) Aquatic Chronic 1, H410 (M=1)	[1] [2] [3] [4]
Tin chloride (SnCl <sub>2</sub> ), dihydrate	EC: 231-868-0 CAS: 10025-69-1	<0.0000003575	Acute Tox. 4, H302 Skin Corr. 1B, H314 Eye Dam. 1, H318 Skin Sens. 1, H317	[1] [2]

See Section 16 for the full text of the H statements declared above.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment, are PBTs, vPvBs or Substances of equivalent concern, or have been assigned a workplace exposure limit and hence require reporting in this section.

#### Type

- [1] Substance classified with a physical, health or environmental hazard
  - [2] Substance with a workplace exposure limit
  - [3] Substance of equivalent concern
  - [4] Substance with carcinogenic, mutagenic or reproductive toxicity properties
- Occupational exposure limits, if available, are listed in Section 8.

## SECTION 4: First aid measures

### 4.1 Description of first aid measures

<b>Eye contact</b>	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.
<b>Inhalation</b>	Remove victim to fresh air and keep at rest in a position comfortable for breathing. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
<b>Skin contact</b>	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
<b>Ingestion</b>	Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel.
<b>Protection of first-aiders</b>	No action shall be taken involving any personal risk or without suitable training.

### 4.2 Most important symptoms and effects, both acute and delayed

#### Over-exposure signs/symptoms

<b>Eye contact</b>	Adverse symptoms may include the following: irritation redness
<b>Inhalation</b>	Adverse symptoms may include the following: respiratory tract irritation coughing
<b>Skin contact</b>	No specific data.
<b>Ingestion</b>	No specific data.

### 4.3 Indication of any immediate medical attention and special treatment needed

<b>Notes to physician</b>	In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
<b>Specific treatments</b>	No specific treatment.

## SECTION 5: Firefighting measures

### 5.1 Extinguishing media

<b>Suitable extinguishing media</b>	Use dry chemical powder.
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<b>Unsuitable extinguishing media</b>	Avoid high pressure media which could cause the formation of a potentially explosive dust-air mixture.
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### 5.2 Special hazards arising from the substance or mixture

<b>Hazards from the substance or mixture</b>	May form explosive dust-air mixture if dispersed. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
<b>Hazardous combustion products</b>	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides phosphorus oxides halogenated compounds metal oxide/oxides

### 5.3 Advice for firefighters

<b>Special precautions for fire-fighters</b>	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
<b>Special protective equipment for fire-fighters</b>	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to British standard BS EN 469 will provide a basic level of protection for chemical incidents.

## SECTION 6: Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

<b>For non-emergency personnel</b>	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing dust. Put on appropriate personal protective equipment.
<b>For emergency responders</b>	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
<b>6.2 Environmental precautions</b>	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.
<b>6.3 Methods and material for containment and cleaning up</b>	
<b>Small spill</b>	Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Vacuum or sweep up material and place in a designated, labelled waste container. Dispose of via a licensed waste disposal contractor.
<b>Large spill</b>	Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labelled waste container. Avoid creating dusty conditions and prevent wind dispersal. Dispose of via a licensed waste disposal contractor.
<b>6.4 Reference to other sections</b>	See Section 1 for emergency contact information. See Section 8 for information on appropriate personal protective equipment. See Section 13 for additional waste treatment information.

## SECTION 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

### 7.1 Precautions for safe handling

<b>Protective measures</b>	Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing dust. Avoid release to the environment. Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Prevent dust accumulation. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Electrical equipment and lighting should be protected to appropriate standards to prevent dust coming into contact with hot surfaces, sparks or other ignition sources. Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material. Empty containers retain product residue and can be hazardous. Do not reuse container.
<b>Advice on general occupational hygiene</b>	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

### 7.2 Conditions for safe storage, including any incompatibilities

Store between the following temperatures: 2 to 8°C (35.6 to 46.4°F). Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Eliminate all ignition sources. Separate from oxidising materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

### 7.3 Specific end use(s)

<b>Recommendations</b>	Not available.
<b>Industrial sector specific solutions</b>	Not available.

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

#### Occupational exposure limits

Product/ingredient name	Exposure limit values
ammonium iron(III) citrate	<b>EH40/2005 WELs (United Kingdom (UK), 1/2020) [iron salts]</b> STEL 15 minutes: 2 mg/m <sup>3</sup> (as Fe). TWA 8 hours: 1 mg/m <sup>3</sup> (as Fe).
ethanol	<b>EH40/2005 WELs (United Kingdom (UK), 1/2020)</b> TWA 8 hours: 1000 ppm. TWA 8 hours: 1920 mg/m <sup>3</sup> .
copper sulphate pentahydrate	<b>EH40/2005 WELs (United Kingdom (UK), 1/2020) [Copper and compounds]</b> STEL 15 minutes: 2 mg/m <sup>3</sup> (as Cu). Form: Dusts and Mists. TWA 8 hours: 1 mg/m <sup>3</sup> (as Cu). Form: Dusts and Mists.
copper dichloride	<b>EH40/2005 WELs (United Kingdom (UK), 1/2020) [Copper and compounds]</b> STEL 15 minutes: 2 mg/m <sup>3</sup> (as Cu). Form: Dusts and Mists. TWA 8 hours: 1 mg/m <sup>3</sup> (as Cu). Form: Dusts and Mists.
Acetic acid.	<b>EH40/2005 WELs (United Kingdom (UK), 1/2020)</b> STEL 15 minutes: 50 mg/m <sup>3</sup> . STEL 15 minutes: 20 ppm. TWA 8 hours: 25 mg/m <sup>3</sup> . TWA 8 hours: 10 ppm.
sodium selenite	<b>EH40/2005 WELs (United Kingdom (UK), 1/2020) [selenium and compounds, except hydrogen selenide]</b> TWA 8 hours: 0.1 mg/m <sup>3</sup> (as Se).
hexaammonium heptamolybdate	<b>EH40/2005 WELs (United Kingdom (UK), 1/2020) [molybdenum soluble compounds]</b> STEL 15 minutes: 10 mg/m <sup>3</sup> (as Mo). TWA 8 hours: 5 mg/m <sup>3</sup> (as Mo).
Cobalt dichloride, hexahydrate	<b>EH40/2005 WELs (United Kingdom (UK), 1/2020) [cobalt and cobalt compounds]</b> Carc. Inhalation sensitiser. TWA 8 hours: 0.1 mg/m <sup>3</sup> (as Co).
copper dichloride	<b>EH40/2005 WELs (United Kingdom (UK), 1/2020) [Copper and compounds]</b> STEL 15 minutes: 2 mg/m <sup>3</sup> (as Cu). Form: Dusts and Mists. TWA 8 hours: 1 mg/m <sup>3</sup> (as Cu). Form: Dusts and Mists.
manganese sulphate	<b>EH40/2005 WELs (United Kingdom (UK), 1/2020) [manganese and its inorganic compounds]</b> TWA 8 hours: 0.2 mg/m <sup>3</sup> (as Mn). Form: Inhalable fraction. TWA 8 hours: 0.05 mg/m <sup>3</sup> (as Mn). Form: Respirable fraction.
cadmium chloride	<b>EH40/2005 WELs (United Kingdom (UK), 1/2020) [Cadmium and cadmium compounds except cadmium oxide fume, cadmium sulphide and cadmium sulphide pigments]</b> Carc. TWA 8 hours: 0.025 mg/m <sup>3</sup> (as Cd).
tin dichloride	<b>EH40/2005 WELs (United Kingdom (UK), 1/2020) [tin compounds, inorganic except SnH4]</b> STEL 15 minutes: 4 mg/m <sup>3</sup> (as Sn). TWA 8 hours: 2 mg/m <sup>3</sup> (as Sn).

#### Biological exposure indices

No exposure indices known.

#### Recommended monitoring procedures

Reference should be made to monitoring standards, such as the following: British Standard BS EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) British Standard BS EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) British Standard BS EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

#### DNELs/DMELs

##### Product/ingredient name

ammonium iron(III) citrate

##### Result

**DNEL - General population - Long term - Oral**  
0.993 mg/kg bw/day  
Effects: Systemic

**DNEL - General population - Long term - Dermal**  
0.993 mg/kg bw/day  
Effects: Systemic

**DNEL - General population - Long term - Inhalation**  
1.73 mg/m<sup>3</sup>  
Effects: Systemic

	<b>DNEL - Workers - Long term - Dermal</b> 2.78 mg/kg bw/day <u>Effects:</u> Systemic
	<b>DNEL - Workers - Long term - Inhalation</b> 9.8 mg/m <sup>3</sup> <u>Effects:</u> Systemic
ethanol	<b>DNEL - Workers - Long term - Inhalation</b> 380 mg/m <sup>3</sup> <u>Effects:</u> Systemic
	<b>DNEL - General population - Long term - Oral</b> 87 mg/kg bw/day <u>Effects:</u> Systemic
	<b>DNEL - General population - Long term - Inhalation</b> 114 mg/m <sup>3</sup> <u>Effects:</u> Systemic
	<b>DNEL - General population - Long term - Dermal</b> 206 mg/kg bw/day <u>Effects:</u> Systemic
	<b>DNEL - Workers - Long term - Dermal</b> 343 mg/kg bw/day <u>Effects:</u> Systemic
	<b>DNEL - General population - Short term - Inhalation</b> 950 mg/m <sup>3</sup> <u>Effects:</u> Local
	<b>DNEL - Workers - Short term - Inhalation</b> 1900 mg/m <sup>3</sup> <u>Effects:</u> Local
Acetic acid.	<b>DNEL - General population - Short term - Inhalation</b> 25 mg/m <sup>3</sup> <u>Effects:</u> Local
	<b>DNEL - General population - Long term - Inhalation</b> 25 mg/m <sup>3</sup> <u>Effects:</u> Local
	<b>DNEL - Workers - Short term - Inhalation</b> 25 mg/m <sup>3</sup> <u>Effects:</u> Local
	<b>DNEL - Workers - Long term - Inhalation</b> 25 mg/m <sup>3</sup> <u>Effects:</u> Local
sodium selenite	<b>DNEL - General population - Long term - Oral</b> 9.42 µg/kg bw/day <u>Effects:</u> Systemic
	<b>DNEL - General population - Long term - Inhalation</b> 0.033 mg/m <sup>3</sup> <u>Effects:</u> Systemic
	<b>DNEL - Workers - Long term - Inhalation</b> 0.11 mg/m <sup>3</sup> <u>Effects:</u> Systemic
	<b>DNEL - General population - Long term - Dermal</b> 9.42 mg/kg bw/day <u>Effects:</u> Systemic
	<b>DNEL - Workers - Long term - Dermal</b> 15.33 mg/kg bw/day <u>Effects:</u> Systemic

**PNECs**

Not available.

**8.2 Exposure controls**

**Appropriate engineering controls** Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapour or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapour or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

**Individual protection measures**

<b>Hygiene measures</b>	Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
<b>Eye/face protection</b>	Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields. If operating conditions cause high dust concentrations to be produced, use dust goggles.
<b>Skin protection</b>	
<b>Hand protection</b>	Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
<b>Body protection</b>	Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
<b>Other skin protection</b>	Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
<b>Respiratory protection</b>	Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.
<b>Environmental exposure controls</b>	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

**SECTION 9: Physical and chemical properties**

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

**9.1 Information on basic physical and chemical properties****Appearance**

<b>Physical state</b>	Solid. [Powder.]
<b>Colour</b>	White. to Off-white.
<b>Odour</b>	Not available.
<b>Odour threshold</b>	Not available.
<b>pH</b>	5 to 7 [Conc. (% w/w): 1.7%]
<b>Melting point/freezing point</b>	Not available.
<b>Initial boiling point and boiling range</b>	Not available.
<b>Flammability (solid, gas)</b>	Not available.
<b>Upper/lower flammability or explosive limits</b>	Not applicable.
<b>Flash point</b>	Not applicable.
<b>Auto-ignition temperature</b>	Not applicable.
<b>Decomposition temperature</b>	Not available.
<b>Viscosity</b>	Dynamic (room temperature): Not available. Kinematic (room temperature): Not available. Kinematic (40°C): Not available.
<b>Solubility in water</b>	Not available.
<b>Partition coefficient: n-octanol/water</b>	Not applicable.
<b>Vapour pressure</b>	Not available.
<b>Evaporation rate</b>	Not available.
<b>Relative density</b>	Not available.

188, 4 mM L-Glutamine

<b>Vapour density</b>	Not applicable.
<b>Explosive properties</b>	Not available.
<b>Oxidising properties</b>	Not available.
<b>Particle characteristics</b>	
<b>Median particle size</b>	Not available.

## 9.2 Other information

Not available.

<b>Burning time</b>	Not available.
<b>Burning rate</b>	Not available.
<b>Solubility in water</b>	Not available.

## SECTION 10: Stability and reactivity

<b>10.1 Reactivity</b>	No specific test data related to reactivity available for this product or its ingredients.
<b>10.2 Chemical stability</b>	The product is stable.
<b>10.3 Possibility of hazardous reactions</b>	Under normal conditions of storage and use, hazardous reactions will not occur.
<b>10.4 Conditions to avoid</b>	Avoid the creation of dust when handling and avoid all possible sources of ignition (spark or flame). Take precautionary measures against electrostatic discharges. To avoid fire or explosion, dissipate static electricity during transfer by earthing and bonding containers and equipment before transferring material. Prevent dust accumulation.
<b>10.5 Incompatible materials</b>	Reactive or incompatible with the following materials: oxidising materials
<b>10.6 Hazardous decomposition products</b>	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## SECTION 11: Toxicological information

### 11.1 Information on toxicological effects

#### Acute toxicity

Product/ingredient name	Result
ammonium iron(III) citrate	<b>Rat - Oral - LD50</b> 2001 mg/kg
ethanol	<b>Rat - Oral - LD50</b> 7060 mg/kg <u>Toxic effects:</u> Lung, Thorax, or Respiration - Other changes
	<b>Rat - Inhalation - LC50 Vapour</b> 124700 mg/m³ [4 hours]
copper sulphate pentahydrate	<b>Rat - Oral - LD50</b> 300 mg/kg
Acetic acid.	<b>Rat - Oral - LD50</b> 3310 mg/kg
	<b>Rabbit - Dermal - LD50</b> 1060 mg/kg
	<b>Rat - Inhalation - LC50 Vapour</b> 11000 mg/m³ [4 hours]
sodium selenite	<b>Rat - Oral - LD50</b> 7 mg/kg <u>Toxic effects:</u> Behavioral - Somnolence (general depressed activity) Lung, Thorax, or Respiration - Dyspnea Gastrointestinal - Hypermotility, diarrhea
Cobalt dichloride, hexahydrate	<b>Rat - Oral - LD50</b> 766 mg/kg <u>Toxic effects:</u> Behavioral - Tremor Gastrointestinal - Hypermotility, diarrhea Gross Metabolite Changes - Weight loss or decreased weight gain
cadmium chloride	<b>Rat - Oral - LD50</b> 665 mg/kg



**Reproductive toxicity**

Not available.

**Conclusion/Summary [Product]** Not available.

**Specific target organ toxicity (single exposure)**

Not available.

**Specific target organ toxicity (repeated exposure)**

Product/ingredient name	Result
manganese sulphate	STOT RE 2, H373
cadmium chloride	STOT RE 1, H372

**Aspiration hazard**

Not available.

**Information on likely routes of exposure** Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.

**Potential acute health effects**

<b>Inhalation</b>	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.
<b>Ingestion</b>	No known significant effects or critical hazards.
<b>Skin contact</b>	No known significant effects or critical hazards.
<b>Eye contact</b>	Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.

**Symptoms related to the physical, chemical and toxicological characteristics**

<b>Inhalation</b>	Adverse symptoms may include the following: respiratory tract irritation coughing
<b>Ingestion</b>	No specific data.
<b>Skin contact</b>	No specific data.
<b>Eye contact</b>	Adverse symptoms may include the following: irritation redness

**Delayed and immediate effects as well as chronic effects from short and long-term exposure****Short term exposure**

**Potential immediate effects** Not available.

**Potential delayed effects** Not available.

**Long term exposure**

**Potential immediate effects** Not available.

**Potential delayed effects** Not available.

**Potential chronic health effects**

Not available.

**Conclusion/Summary [Product]** Not available.

<b>General</b>	Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.
<b>Carcinogenicity</b>	No known significant effects or critical hazards.
<b>Mutagenicity</b>	No known significant effects or critical hazards.
<b>Reproductive toxicity</b>	No known significant effects or critical hazards.
<b>Other information</b>	Not available.

## SECTION 12: Ecological information

### 12.1 Toxicity

**Product/ingredient name**

ethanol

**Result**

**Acute - LC50 - Marine water**  
Fish - Bleak - *Alburnus alburnus*  
Size: 8 to 10 cm  
11 g/l [96 hours]  
Effect: Mortality

**Chronic - NOEC - Marine water**  
Algae - Green algae - *Ulva pertusa*  
4.995 mg/l [96 hours]  
Effect: Reproduction

**Acute - EC50 - Fresh water**  
Crustaceans - Ostracod - *Cypris subglobosa*  
1074 mg/l [48 hours]  
Effect: Intoxication

**Chronic - NOEC - Fresh water**  
Daphnia - Water flea - *Daphnia magna* - Neonate  
Age: <24 hours  
100 µl/l [21 days]  
Effect: Mortality

**Acute - EC50 - Marine water**  
Algae - Green algae - *Ulva pertusa*  
Size: 9.4 mm  
3306 mg/l [96 hours]  
Effect: Reproduction

copper sulphate pentahydrate

**Acute - EC50 - Fresh water**  
US EPA  
Daphnia - Water flea - *Daphnia magna*  
Age: 1  
182 ppb [48 hours]  
Effect: Intoxication

**Acute - LC50 - Fresh water**  
US EPA  
Fish - Rainbow trout,donaldson trout - *Oncorhynchus mykiss*  
Weight: 0.6 g  
0.032 ppm [96 hours]  
Effect: Mortality

copper dichloride

**Acute - EC50 - Marine water**  
US EPA  
Algae - Diatom - *Skeletonema costatum*  
Age: 3 days  
9.52 ppb [72 hours]  
Effect: Population

**Chronic - NOEC - Marine water**  
US EPA  
Crustaceans - Harpacticoid copepod - *Tisbe battagliai*  
Age: <24 hours  
18 ppb [21 days]  
Effect: Mortality

Acetic acid.

**Acute - LC50 - Marine water**  
Crustaceans - Brine shrimp - *Artemia salina*  
32 mg/l [48 hours]  
Effect: Mortality

**Acute - LC50 - Fresh water**  
Fish - Bluegill - *Lepomis macrochirus*  
75 ppm [96 hours]  
Effect: Mortality

sodium selenite

**Acute - LC50 - Marine water**  
Fish - Grass goby - *Zosterisessor ophiocephalus* - Adult  
Size: 15.6 cm; Weight: 41.7 g  
0.29 ppm [96 hours]  
Effect: Mortality

**Acute - LC50 - Fresh water**

Daphnia - Water flea - *Daphnia pulicaria*  
Age: ≤24 hours  
 0.006 mg/l [48 hours]  
Effect: Mortality

**Chronic - NOEC - Fresh water**

Daphnia - Water flea - *Daphnia magna*  
Age: <24 hours  
 0.24 mg/l [21 days]  
Effect: Mortality

**Chronic - NOEC - Marine water**

Algae - Green algae - *Dunaliella salina* - Exponential growth phase  
Size: 3.8 to 20.3  
 1 mg/l [4 days]  
Effect: Cells

**Acute - EC50 - Fresh water**

Algae - Green algae - *Scenedesmus acutus var. acutus*  
 80 µg/l [3 days]  
Effect: Population

**Chronic - NOEC - Fresh water**

Fish - Medaka, high-eyes - *Oryzias latipes* - Juvenile (Fledgling, Hatchling, Weanling)  
Age: 10 days; Weight: 0.85 mg  
 3.936 ng/ml [210 days]  
Effect: Feeding Behavior

**LC50**

Fish - Trout - *Oncorhynchus mykiss*  
 420 mg/l [96 hours]

**EC50**

Daphnia - Daphnia - *Daphnia magna*  
 140 mg/l [48 hours]

**EC50**

Algae - Algae - *Desmodesmus subspicatus*  
 41 mg/l [72 hours]

**Acute - EC50 - Marine water**

US EPA  
 Algae - Diatom - *Skeletonema costatum*  
Age: 3 days  
 9.52 ppb [72 hours]  
Effect: Population

**Chronic - NOEC - Marine water**

US EPA  
 Crustaceans - Harpacticoid copepod - *Tisbe battagliai*  
Age: <24 hours  
 18 ppb [21 days]  
Effect: Mortality

hexaammonium heptamolybdate

copper dichloride

**Conclusion/Summary [Product]** Not available.**Ingredient name**

manganese sulphate

**Conclusion/Summary**

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

**12.2 Persistence and degradability****Product/ingredient name**

ethanol

**Result****Aerobic**

100% [20 days] - Readily

**Conclusion/Summary [Product]** Not available.**Product/ingredient name**

ethanol

**Aquatic half-life**

-

**Photolysis**

-

**Biodegradability**

Readily

Acetic acid.

-

&gt;60%; 28 day(s)

Readily

**12.3 Bioaccumulative potential**

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
≤1	-0.35	0.66	Low
≤0.1	-0.17	3.16	Low
<0.001	-	5.8	Low

**12.4 Mobility in soil**

**Soil/water partition coefficient** Not available.

**Mobility** Not available.

**12.5 Results of PBT and vPvB assessment**

ammonium iron(III) citrate	No	N/A	N/A	No	N/A	N/A	N/A
ethanol	No	N/A	No	No	No	N/A	No
copper sulphate pentahydrate	No	No	No	No	No	No	No
copper dichloride	No	No	No	No	No	No	No
Acetic acid.	No	N/A	No	No	No	N/A	No
sodium selenite	No	No	No	No	No	No	No
hexaammonium heptamolybdate	No	No	No	No	No	No	No
Cobalt dichloride, hexahydrate	No	No	No	No	No	No	No
copper dichloride	No	No	No	No	No	No	No
manganese sulphate	No	No	No	No	No	No	No
cadmium chloride	No	No	No	No	No	No	No
tin dichloride	No	No	No	No	No	No	No

**12.6 Other adverse effects** No known significant effects or critical hazards.

**SECTION 13: Disposal considerations**

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

**13.1 Waste treatment methods****Product****Methods of disposal**

The generation of waste should be avoided or minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.

**Hazardous waste**

The classification of the product may meet the criteria for a hazardous waste.

**Packaging****Methods of disposal**

The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

**Special precautions**

This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

**SECTION 14: Transport information**

	ADR/RID	ADN	IMDG	IATA
<b>14.1 UN number</b>	Not regulated.	Not regulated.	Not regulated.	Not regulated.
<b>14.2 UN proper shipping name</b>	-	-	-	-
<b>14.3 Transport hazard class(es)</b>	-	-	-	-
<b>14.4 Packing group</b>	-	-	-	-
<b>14.5 Environmental hazards</b>	No.	No.	No.	No.

<b>Additional information</b>	-	-	-	-
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**14.6 Special precautions for user** **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**14.7 Transport in bulk according to IMO instruments** Not available.

## SECTION 15: Regulatory information

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

#### UK (GB)/REACH

##### Annex XIV - List of substances subject to authorisation

###### **Annex XIV**

None of the components are listed.

###### Substances of very high concern

Intrinsic property	Ingredient name	Status	Reference number	Date of revision
Carcinogen	Cobalt chloride (CoCl <sub>2</sub> ), hexahydrate	Candidate	-	10/28/2008
	Cadmium chloride, hydrate (2:5)	Candidate	-	6/16/2014
Mutagen	Cadmium chloride, hydrate (2:5)	Candidate	-	6/16/2014
Toxic to reproduction	Cobalt chloride (CoCl <sub>2</sub> ), hexahydrate	Candidate	-	10/28/2008
	Cadmium chloride, hydrate (2:5)	Candidate	-	6/16/2014
Substance of equivalent concern for human health	Cadmium chloride, hydrate (2:5)	Candidate	-	6/16/2014

###### Ozone depleting substances

Not listed.

###### Prior Informed Consent (PIC)

Not listed.

###### Persistent Organic Pollutants

Not listed.

###### Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Product/ingredient name	%	Designation [Usage]
Molybdate (Mo <sub>7</sub> O <sub>24</sub> 6-), ammonium, hydrate (1:6: 4)	≤0.1	65
Cadmium chloride, hydrate (2:5)	≤0.02	23

**Labelling** Not applicable.

###### Seveso Directive

This product is not controlled under the Seveso Directive.

Product/ingredient name	List name	Name on list	Classification	Notes
Cobalt dichloride, hexahydrate	EH40/2005 WELs	cobalt and cobalt compounds	Carc	-
cadmium chloride	EH40/2005 WELs	Cadmium and cadmium compounds except cadmium oxide fume, cadmium sulphide and cadmium sulphide pigments	Carc	-

###### EU regulations

**Industrial emissions (integrated pollution prevention and control) - Air** Not listed

**Industrial emissions (integrated pollution prevention and control) - Water** Not listed

**International regulations****Chemical Weapon Convention List Schedules I, II & III Chemicals**

Not listed.

**Montreal Protocol**

Not listed.

**Stockholm Convention on Persistent Organic Pollutants**

Not listed.

**Rotterdam Convention on Prior Informed Consent (PIC)**

Not listed.

**UNECE Aarhus Protocol on POPs and Heavy Metals**

Not listed.

**Inventory list**

<b>United States</b>	Not determined.
<b>Canada inventory</b>	Not determined.
<b>China</b>	Not determined.
<b>Japan</b>	<b>Japan inventory (CSCL):</b> Not determined. <b>Japan inventory (ISHL):</b> Not determined.
<b>15.2 Chemical safety assessment</b>	This product contains substances for which Chemical Safety Assessments are still required.

**SECTION 16: Other information**

► Indicates information that has changed from previously issued version.

**Abbreviations and acronyms**

ATE = Acute Toxicity Estimate
GB CLP = UK CLP (EC No 1272/2008) on the Classification, Labelling and Packaging of Substances and Mixtures as amended by (EU Exit) Regulations 2019 No. 720 and amendments
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
EUH statement = GB CLP-specific Hazard statement
N/A = Not available
PBT = Persistent, Bioaccumulative and Toxic
PNEC = Predicted No Effect Concentration
RRN = REACH Registration Number
SGG = Segregation Group
vPvB = Very Persistent and Very Bioaccumulative

**Procedure used to derive the classification**

Classification	Justification
Aquatic Chronic 3, H412	Calculation method

<b>Full text of abbreviated H statements</b>	H225      Highly flammable liquid and vapour. H226      Flammable liquid and vapour. H300      Fatal if swallowed. H301      Toxic if swallowed. H302      Harmful if swallowed. H312      Harmful in contact with skin. H314      Causes severe skin burns and eye damage. H317      May cause an allergic skin reaction. H318      Causes serious eye damage. H330      Fatal if inhaled. H331      Toxic if inhaled. H332      Harmful if inhaled. H334      May cause allergy or asthma symptoms or breathing difficulties if inhaled. H340      May cause genetic defects. H341      Suspected of causing genetic defects. H350      May cause cancer. H350i     May cause cancer by inhalation. H360F     May damage fertility. H360FD    May damage fertility. May damage the unborn child. H372      Causes damage to organs through prolonged or repeated exposure. H373      May cause damage to organs through prolonged or repeated exposure. H400      Very toxic to aquatic life. H410      Very toxic to aquatic life with long lasting effects. H411      Toxic to aquatic life with long lasting effects. H412      Harmful to aquatic life with long lasting effects.
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	EUH031 Contact with acids liberates toxic gas.
<b>Full text of classifications</b>	
Acute Tox. 2	ACUTE TOXICITY - Category 2
Acute Tox. 3	ACUTE TOXICITY - Category 3
Acute Tox. 4	ACUTE TOXICITY - Category 4
Aquatic Acute 1	SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 1
Aquatic Chronic 1	LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 1
Aquatic Chronic 2	LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 2
Aquatic Chronic 3	LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3
Carc. 1B	CARCINOGENICITY - Category 1B
Eye Dam. 1	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1
Flam. Liq. 2	FLAMMABLE LIQUIDS - Category 2
Flam. Liq. 3	FLAMMABLE LIQUIDS - Category 3
Muta. 1B	GERM CELL MUTAGENICITY - Category 1B
Muta. 2	GERM CELL MUTAGENICITY - Category 2
Repr. 1B	REPRODUCTIVE TOXICITY - Category 1B
Resp. Sens. 1	RESPIRATORY SENSITISATION - Category 1
Skin Corr. 1A	SKIN CORROSION/IRRITATION - Category 1A
Skin Corr. 1B	SKIN CORROSION/IRRITATION - Category 1B
Skin Sens. 1	SKIN SENSITISATION - Category 1
STOT RE 1	SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 1
STOT RE 2	SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 2

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Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.