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 SH30872.03

90SH30872.03

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

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

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

Hours of operation
Mo. - Fr.
08.30 - 17.00

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 (Calll 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 explosible dust-air mixture if dispersed.

SECTION 3: Composition/information on ingredients

3.2 Mixtures Mixture

Product/ingredient name	Identifiers	%	Classification	Type

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 (CuCl2), 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 (Mo7O246-), 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 (CuCl2), 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 (SnCl2), 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

Eye contact	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.
Inhalation	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.
Skin contact	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
Ingestion	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.
Protection of first-aiders	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

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

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician	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.
Specific treatments	No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	Use dry chemical powder.
Unsuitable extinguishing media	Avoid high pressure media which could cause the formation of a potentially explosible dust-air mixture.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture	May form explosible 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.
Hazardous combustion products	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

Special precautions for fire-fighters	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.
Special protective equipment for fire-fighters	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

For non-emergency personnel	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.
For emergency responders	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".
6.2 Environmental precautions	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.

6.3 Methods and material for containment and cleaning up

Small spill	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.
Large spill	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.
6.4 Reference to other sections	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

Protective measures	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.
Advice on general occupational hygiene	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)

Recommendations	Not available.
Industrial sector specific solutions	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	**EH40/2005 WELs (United Kingdom (UK), 1/2020) [iron salts]** STEL 15 minutes: 2 mg/m³ (as Fe). TWA 8 hours: 1 mg/m³ (as Fe).
ethanol	**EH40/2005 WELs (United Kingdom (UK), 1/2020)** TWA 8 hours: 1000 ppm. TWA 8 hours: 1920 mg/m³.
copper sulphate pentahydrate	**EH40/2005 WELs (United Kingdom (UK), 1/2020) [Copper and compounds]** STEL 15 minutes: 2 mg/m³ (as Cu). Form: Dusts and Mists. TWA 8 hours: 1 mg/m³ (as Cu). Form: Dusts and Mists.
copper dichloride	**EH40/2005 WELs (United Kingdom (UK), 1/2020) [Copper and compounds]** STEL 15 minutes: 2 mg/m³ (as Cu). Form: Dusts and Mists. TWA 8 hours: 1 mg/m³ (as Cu). Form: Dusts and Mists.
Acetic acid.	**EH40/2005 WELs (United Kingdom (UK), 1/2020)** STEL 15 minutes: 50 mg/m³. STEL 15 minutes: 20 ppm. TWA 8 hours: 25 mg/m³. TWA 8 hours: 10 ppm.
sodium selenite	**EH40/2005 WELs (United Kingdom (UK), 1/2020) [selenium and compounds, except hydrogen selenide]** TWA 8 hours: 0.1 mg/m³ (as Se).
hexaammonium heptamolybdate	**EH40/2005 WELs (United Kingdom (UK), 1/2020) [molybdenum soluble compounds]** STEL 15 minutes: 10 mg/m³ (as Mo). TWA 8 hours: 5 mg/m³ (as Mo).
Cobalt dichloride, hexahydrate	**EH40/2005 WELs (United Kingdom (UK), 1/2020) [cobalt and cobalt compounds]** Carc. Inhalation sensitiser. TWA 8 hours: 0.1 mg/m³ (as Co).
copper dichloride	**EH40/2005 WELs (United Kingdom (UK), 1/2020) [Copper and compounds]** STEL 15 minutes: 2 mg/m³ (as Cu). Form: Dusts and Mists. TWA 8 hours: 1 mg/m³ (as Cu). Form: Dusts and Mists.
manganese sulphate	**EH40/2005 WELs (United Kingdom (UK), 1/2020) [manganese and its inorganic compounds]** TWA 8 hours: 0.2 mg/m³ (as Mn). Form: Inhalable fraction. TWA 8 hours: 0.05 mg/m³ (as Mn). Form: Respirable fraction.
cadmium chloride	**EH40/2005 WELs (United Kingdom (UK), 1/2020) [Cadmium and cadmium compounds except cadmium oxide fume, cadmium sulphide and cadmium sulphide pigments]** Carc. TWA 8 hours: 0.025 mg/m³ (as Cd).
tin dichloride	**EH40/2005 WELs (United Kingdom (UK), 1/2020) [tin compounds, inorganic except SnH4]** STEL 15 minutes: 4 mg/m³ (as Sn). TWA 8 hours: 2 mg/m³ (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	Result
ammonium iron(III) citrate	**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/m³ Effects: Systemic

	DNEL - Workers - Long term - Dermal 2.78 mg/kg bw/day Effects: Systemic **DNEL - Workers - Long term - Inhalation** 9.8 mg/m³ Effects: Systemic
ethanol	**DNEL - Workers - Long term - Inhalation** 380 mg/m³ Effects: Systemic **DNEL - General population - Long term - Oral** 87 mg/kg bw/day Effects: Systemic **DNEL - General population - Long term - Inhalation** 114 mg/m³ Effects: Systemic **DNEL - General population - Long term - Dermal** 206 mg/kg bw/day Effects: Systemic **DNEL - Workers - Long term - Dermal** 343 mg/kg bw/day Effects: Systemic **DNEL - General population - Short term - Inhalation** 950 mg/m³ Effects: Local **DNEL - Workers - Short term - Inhalation** 1900 mg/m³ Effects: Local
Acetic acid.	**DNEL - General population - Short term - Inhalation** 25 mg/m³ Effects: Local **DNEL - General population - Long term - Inhalation** 25 mg/m³ Effects: Local **DNEL - Workers - Short term - Inhalation** 25 mg/m³ Effects: Local **DNEL - Workers - Long term - Inhalation** 25 mg/m³ Effects: Local
sodium selenite	**DNEL - General population - Long term - Oral** 9.42 µg/kg bw/day Effects: Systemic **DNEL - General population - Long term - Inhalation** 0.033 mg/m³ Effects: Systemic **DNEL - Workers - Long term - Inhalation** 0.11 mg/m³ Effects: Systemic **DNEL - General population - Long term - Dermal** 9.42 mg/kg bw/day Effects: Systemic **DNEL - Workers - Long term - Dermal** 15.33 mg/kg bw/day Effects: 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

Hygiene measures	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.
Eye/face protection	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.

Skin protection

Hand protection	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.
Body protection	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.
Other skin protection	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.
Respiratory protection	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.
Environmental exposure controls	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

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

188, 4 mM L-Glutamine

Vapour density	Not applicable.
Explosive properties	Not available.
Oxidising properties	Not available.

Particle characteristics

Median particle size	Not available.

9.2 Other information

Not available.

Burning time	Not available.
Burning rate	Not available.
Solubility in water	Not available.

SECTION 10: Stability and reactivity

10.1 Reactivity	No specific test data related to reactivity available for this product or its ingredients.
10.2 Chemical stability	The product is stable.
10.3 Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur.
10.4 Conditions to avoid	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.
10.5 Incompatible materials	Reactive or incompatible with the following materials: oxidising materials
10.6 Hazardous decomposition products	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	**Rat - Oral - LD50** 2001 mg/kg
ethanol	**Rat - Oral - LD50** 7060 mg/kg Toxic effects: Lung, Thorax, or Respiration - Other changes **Rat - Inhalation - LC50 Vapour** 124700 mg/m³ [4 hours]
copper sulphate pentahydrate	**Rat - Oral - LD50** 300 mg/kg
Acetic acid.	**Rat - Oral - LD50** 3310 mg/kg **Rabbit - Dermal - LD50** 1060 mg/kg **Rat - Inhalation - LC50 Vapour** 11000 mg/m³ [4 hours]
sodium selenite	**Rat - Oral - LD50** 7 mg/kg Toxic effects: Behavioral - Somnolence (general depressed activity) Lung, Thorax, or Respiration - Dyspnea Gastrointestinal - Hypermotility, diarrhea
Cobalt dichloride, hexahydrate	**Rat - Oral - LD50** 766 mg/kg Toxic effects: Behavioral - Tremor Gastrointestinal - Hypermotility, diarrhea Gross Metabolite Changes - Weight loss or decreased weight gain
cadmium chloride	**Rat - Oral - LD50** 665 mg/kg

tin dichloride	**Rat - Oral - LD50** 700 mg/kg

Conclusion/Summary [Product] Not available.

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapours) (mg/l)	Inhalation (dusts and mists) (mg/l)
CDM4PERMAb™	89581.9	N/A	N/A	N/A	N/A
ammonium iron(III) citrate	2001	N/A	N/A	N/A	N/A
ethanol	7000	N/A	N/A	124.7	N/A
copper sulphate pentahydrate	500	N/A	N/A	N/A	N/A
Acetic acid.	3310	1060	N/A	11	N/A
sodium selenite	7	N/A	N/A	N/A	0.5
Cobalt dichloride, hexahydrate	766	N/A	N/A	N/A	N/A
cadmium chloride	100	N/A	N/A	0.5	N/A
tin dichloride	700	N/A	N/A	N/A	N/A

Skin corrosion/irritation

Not available.

Conclusion/Summary [Product] Not available.

Serious eye damage/eye irritation

Not available.

Conclusion/Summary [Product] Not available.

Respiratory corrosion/irritation

Not available.

Conclusion/Summary [Product] Not available.

Respiratory or skin sensitization

Not available.

Skin

Conclusion/Summary [Product] Not available.

Ingredient name	Conclusion/Summary
tin dichloride	May cause allergic reactions in certain individuals.

Respiratory

Conclusion/Summary [Product] Not available.

Ingredient name	Conclusion/Summary
tin dichloride	May cause allergic reactions in certain individuals.

Germ cell mutagenicity

Not available.

Conclusion/Summary [Product] Not available.

Carcinogenicity

Not available.

Conclusion/Summary [Product] Not available.

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

Inhalation Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.

Ingestion No known significant effects or critical hazards.

Skin contact No known significant effects or critical hazards.

Eye contact 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

Inhalation Adverse symptoms may include the following:
respiratory tract irritation
coughing

Ingestion No specific data.

Skin contact No specific data.

Eye contact 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.

General Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.

Carcinogenicity No known significant effects or critical hazards.

Mutagenicity No known significant effects or critical hazards.

Reproductive toxicity No known significant effects or critical hazards.

Other information Not available.

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result
ethanol	**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
hexaammonium heptamolybdate	**LC50** Fish - Trout - *Oncorhynchus mykiss* 420 mg/l [96 hours] **EC50** Daphnia - Daphnia - *Daphnia magana* 140 mg/l [48 hours] **EC50** Algae - Algae - *Desmodesmus subspicatus* 41 mg/l [72 hours]
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

Conclusion/Summary [Product] Not available.

Ingredient name	**Conclusion/Summary**
manganese sulphate	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

12.2 Persistence and degradability

Product/ingredient name	**Result**
ethanol	**Aerobic** 100% [20 days] - Readily

Conclusion/Summary [Product] Not available.

Product/ingredient name	**Aquatic half-life**	**Photolysis**	**Biodegradability**
ethanol	-	-	Readily
Acetic acid.	-	>60%; 28 day(s)	Readily

12.3 Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	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
14.1 UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.
14.2 UN proper shipping name	-	-	-	-
14.3 Transport hazard class(es)	-	-	-	-
14.4 Packing group	-	-	-	-
14.5 Environmental hazards	No.	No.	No.	No.

Additional information	-	-	-	-

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 (CoCl2), 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 (CoCl2), 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 (Mo7O246-), 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

United States	Not determined.
Canada inventory	Not determined.
China	Not determined.
Japan	**Japan inventory (CSCL)**: Not determined. **Japan inventory (ISHL)**: Not determined.
15.2 Chemical safety assessment	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

Full text of abbreviated H statements

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.

	EUH031	Contact with acids liberates toxic gas.
Full text of classifications	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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Date of previous issue	No previous validation	
Version	1	

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