

SAFETY DATA SHEET

IMMULITE® 2000 Vitamin B12

SIEMENS
Healthineers

SDS no.:

L2KVB2_6

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

1.1 Product identifier

Product name : IMMULITE® 2000 Vitamin B12
Product code : L2KVB2/6, 10380913, 10380914

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

Identified uses	Vitamin B12 "A" Reagent Wedge R1	Diagnostic agents.
	Vitamin B12 A Reagent Wedge R2	Diagnostic agents.
	Vitamin B12 "D" Reagent Wedge R1	Diagnostic agents.
	Vitamin B12 "D" Reagent Wedge R2	Diagnostic agents.
	Vitamin B12 Adjustors	Diagnostic agents.

Restrictions on use For professional users only.

Supplier : Siemens Healthcare Diagnostics Limited
 Park View,
 Watchmoor Park,
 Camberley,
 Surrey,
 GU15 3YL
 United Kingdom

Phone: +44 (0) 345 600 1955

e-mail address of person responsible for this SDS : dx.msds.healthcare@siemens-healthineers.com

1.4 Emergency telephone number

CHEMTREC: +44 20 3807 3798

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition	Vitamin B12 "A" Reagent Wedge R1	Mixture
	Vitamin B12 A Reagent Wedge R2	Mixture
	Vitamin B12 "D" Reagent Wedge R1	Mixture
	Vitamin B12 "D" Reagent Wedge R2	Mixture
	Vitamin B12 Adjustors	Mixture

Classification according to UK CLP/GHS

Vitamin B12 A Reagent Wedge R2

Met. Corr. 1, H290

Skin Corr. 1, H314

Eye Dam. 1, H318

Repr. 1B, H360FD

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

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 :



SECTION 2: Hazards identification

Signal word	: Vitamin B12 "A" Reagent Wedge R1 Vitamin B12 A Reagent Wedge R2 Vitamin B12 "D" Reagent Wedge R1 Vitamin B12 "D" Reagent Wedge R2 Vitamin B12 Adjustors	No signal word. Danger No signal word. No signal word. No signal word.
Hazard statements	: Vitamin B12 "A" Reagent Wedge R1 Vitamin B12 A Reagent Wedge R2 Vitamin B12 "D" Reagent Wedge R1 Vitamin B12 "D" Reagent Wedge R2 Vitamin B12 Adjustors	No known significant effects or critical hazards. H290 - May be corrosive to metals. H314 - Causes severe skin burns and eye damage. H360FD - May damage fertility. May damage the unborn child. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
<u>Precautionary statements</u>		
Prevention	: Vitamin B12 "A" Reagent Wedge R1 Vitamin B12 A Reagent Wedge R2 Vitamin B12 "D" Reagent Wedge R1 Vitamin B12 "D" Reagent Wedge R2 Vitamin B12 Adjustors	Not applicable. P201 - Obtain special instructions before use. P264 - Wash hands thoroughly after handling. P234 - Keep only in original container. P280 - Wear protective gloves/protective clothing/eye protection/face protection. Not applicable. Not applicable. Not applicable.
Response	: Vitamin B12 "A" Reagent Wedge R1 Vitamin B12 A Reagent Wedge R2 Vitamin B12 "D" Reagent Wedge R1 Vitamin B12 "D" Reagent Wedge R2 Vitamin B12 Adjustors	Not applicable. P308 + P313 - IF exposed or concerned: Get medical advice/attention. P301 - IF SWALLOWED: P330 - Rinse mouth. P331 - Do NOT induce vomiting. P303 - IF ON SKIN (or hair): P361 - Remove/Take off immediately all contaminated clothing. P353 - Rinse skin with water or shower. P310 - Immediately call a POISON CENTER or doctor/physician. P305 - IF IN EYES: P351 - Rinse cautiously with water for several minutes. P338 - Remove contact lenses, if present and easy to do. Continue rinsing. P390 - Absorb spillage to prevent material damage. Not applicable. Not applicable. Not applicable.
Storage	: Vitamin B12 "A" Reagent Wedge R1 Vitamin B12 A Reagent Wedge R2 Vitamin B12 "D" Reagent Wedge R1 Vitamin B12 "D" Reagent Wedge R2 Vitamin B12 Adjustors	Not applicable. Not applicable. Not applicable. Not applicable. Not applicable.

SECTION 2: Hazards identification

Disposal	: Vitamin B12 "A" Reagent Wedge R1 Vitamin B12 A Reagent Wedge R2 Vitamin B12 "D" Reagent Wedge R1 Vitamin B12 "D" Reagent Wedge R2 Vitamin B12 Adjustors	Not applicable. P501 - Dispose of contents and container in accordance with all local, regional, and national regulations. Not applicable. Not applicable. Not applicable.
Supplemental label elements	: Vitamin B12 "A" Reagent Wedge R1 Vitamin B12 A Reagent Wedge R2 Vitamin B12 "D" Reagent Wedge R1 Vitamin B12 "D" Reagent Wedge R2 Vitamin B12 Adjustors	Safety data sheet available on request. Not applicable. Not applicable. Not applicable. Not applicable.
Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles	: Vitamin B12 "A" Reagent Wedge R1 Vitamin B12 A Reagent Wedge R2 Vitamin B12 "D" Reagent Wedge R1 Vitamin B12 "D" Reagent Wedge R2 Vitamin B12 Adjustors	Not applicable. Restricted to professional users. Not applicable. Not applicable. Not applicable.
2.3 Other hazards		
Product meets the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII	: Vitamin B12 "A" Reagent Wedge R1 Vitamin B12 A Reagent Wedge R2 Vitamin B12 "D" Reagent Wedge R1 Vitamin B12 "D" Reagent Wedge R2 Vitamin B12 Adjustors	This mixture does not contain any substances that are assessed to be a PBT or a vPvB. This mixture does not contain any substances that are assessed to be a PBT or a vPvB. This mixture does not contain any substances that are assessed to be a PBT or a vPvB. This mixture does not contain any substances that are assessed to be a PBT or a vPvB. This mixture does not contain any substances that are assessed to be a PBT or a vPvB. 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	: Vitamin B12 "A" Reagent Wedge R1 Vitamin B12 A Reagent Wedge R2 Vitamin B12 "D" Reagent Wedge R1 Vitamin B12 "D" Reagent Wedge R2 Vitamin B12 Adjustors	None known. None known. None known. None known. None known.
Additional information	: Potentially biohazardous material. Sodium azide may react with lead or copper plumbing to form highly explosive metal azides.	

SECTION 3: Composition/information on ingredients

3.1 Substances	: Vitamin B12 "A" Reagent Wedge R1 Vitamin B12 A Reagent Wedge R2 Vitamin B12 "D" Reagent Wedge R1 Vitamin B12 "D" Reagent Wedge R2 Vitamin B12 Adjustors	Mixture Mixture Mixture Mixture Mixture
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Product/ingredient name	Identifiers	%	Classification	Type
Vitamin B12 "A" Reagent Wedge R1 (R*,R*)-(±)-1,4-dimercaptobutane-2,3-diol	EC: 248-531-9 CAS: 27565-41-9	<10	Acute Tox. 4, H302 Skin Irrit. 2, H315 Eye Irrit. 2, H319 STOT SE 3, H335	[1]
Vitamin B12 A Reagent Wedge				

SECTION 3: Composition/information on ingredients

R2 sodium hydroxide	EC: 215-185-5 CAS: 1310-73-2 Index: 011-002-00-6	≤10	Skin Corr. 1A, H314 Eye Dam. 1, H318	[1] [2]
disodium tetraborate decahydrate	EC: 215-540-4 CAS: 1303-96-4 Index: 005-011-00-4	≤1	Repr. 1B, H360FD	[1] [2]
sodium azide	EC: 247-852-1 CAS: 26628-22-8 Index: 011-004-00-7	<0.1	Acute Tox. 2, H300 Acute Tox. 1, H310 Aquatic Acute 1, H400 (M=1) Aquatic Chronic 1, H410 (M=1) EUH032	[1] [2]
salts of hydrogen cyanide	EC: 205-792-3 CAS: 151-50-8 Index: 006-007-00-5	<0.01	Acute Tox. 1, H300 Acute Tox. 1, H310 Acute Tox. 2, H330 Skin Corr. 1, H314 Eye Dam. 1, H318 Aquatic Acute 1, H400 (M=10) Aquatic Chronic 1, H410 (M=1) EUH032 See Section 16 for the full text of the H statements declared above.	[1] [2]

Type

[1] Substance classified with a health or environmental hazard

[2] Substance with a workplace exposure limit

Occupational exposure limits, if available, are listed in Section 8.

SECTION 4: First aid measures**4.1 Description of first aid measures****Eye contact** : Vitamin B12 "A" Reagent Wedge R1

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.

Vitamin B12 A Reagent Wedge R2

Get medical attention immediately. Call a poison center or physician.

Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.

Vitamin B12 "D" Reagent Wedge R1

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.

Vitamin B12 "D" Reagent Wedge R2

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.

Vitamin B12 Adjustors

Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove

SECTION 4: First aid measures**Inhalation**

: Vitamin B12 "A" Reagent Wedge R1

Vitamin B12 A Reagent Wedge R2

Vitamin B12 "D" Reagent Wedge R1

Vitamin B12 "D" Reagent Wedge R2

Vitamin B12 Adjustors

Skin contact

: Vitamin B12 "A" Reagent Wedge R1

Vitamin B12 A Reagent Wedge R2

Vitamin B12 "D" Reagent Wedge R1

Vitamin B12 "D" Reagent Wedge R2

any contact lenses. Get medical attention if irritation occurs.

Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.

Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur. 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. Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur. 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. Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

Get medical attention immediately. Call a poison center or physician. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

Flush contaminated skin with plenty of

SECTION 4: First aid measures

Ingestion

Vitamin B12 Adjustors

water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.

: Vitamin B12 "A" Reagent Wedge R1

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. Get medical attention if symptoms occur.

Vitamin B12 A Reagent Wedge R2

Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs.

Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Vitamin B12 "D" Reagent Wedge R1

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. Get medical attention if symptoms occur.

Vitamin B12 "D" Reagent Wedge R2

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. Get medical attention if symptoms occur.

Vitamin B12 Adjustors

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. Get medical attention if symptoms occur.

Protection of first-aiders

: Vitamin B12 "A" Reagent Wedge R1

No action shall be taken involving any personal risk or without suitable training.

Vitamin B12 A Reagent Wedge R2

No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be

SECTION 4: First aid measures

Vitamin B12 "D" Reagent Wedge R1

Vitamin B12 "D" Reagent Wedge R2

Vitamin B12 Adjustors

dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

No action shall be taken involving any personal risk or without suitable training. No action shall be taken involving any personal risk or without suitable training. 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 : Vitamin B12 "A" Reagent Wedge R1
Vitamin B12 A Reagent Wedge R2

No specific data.
Adverse symptoms may include the following:
pain
watering
redness

Vitamin B12 "D" Reagent Wedge R1
Vitamin B12 "D" Reagent Wedge R2
Vitamin B12 Adjustors

No specific data.
No specific data.
No specific data.

Inhalation : Vitamin B12 "A" Reagent Wedge R1
Vitamin B12 A Reagent Wedge R2
Vitamin B12 "D" Reagent Wedge R1
Vitamin B12 "D" Reagent Wedge R2
Vitamin B12 Adjustors

No specific data.
No specific data.
No specific data.
No specific data.
No specific data.

Skin contact : Vitamin B12 "A" Reagent Wedge R1
Vitamin B12 A Reagent Wedge R2

No specific data.
Adverse symptoms may include the following:
pain or irritation
redness

Vitamin B12 "D" Reagent Wedge R1
Vitamin B12 "D" Reagent Wedge R2
Vitamin B12 Adjustors

blistering may occur
No specific data.
No specific data.
No specific data.

Ingestion : Vitamin B12 "A" Reagent Wedge R1
Vitamin B12 A Reagent Wedge R2

No specific data.
Adverse symptoms may include the following:

Vitamin B12 "D" Reagent Wedge R1
Vitamin B12 "D" Reagent Wedge R2
Vitamin B12 Adjustors

stomach pains
No specific data.
No specific data.
No specific data.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician : Vitamin B12 "A" Reagent Wedge R1

Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Vitamin B12 A Reagent Wedge R2

Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. 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.

Vitamin B12 "D" Reagent Wedge R1

Vitamin B12 "D" Reagent Wedge R2

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

SECTION 4: First aid measures

	Vitamin B12 Adjustors	48 hours. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments	: Vitamin B12 "A" Reagent Wedge R1 Vitamin B12 A Reagent Wedge R2 Vitamin B12 "D" Reagent Wedge R1 Vitamin B12 "D" Reagent Wedge R2 Vitamin B12 Adjustors Vitamin B12 "A" Reagent Wedge R1 Vitamin B12 A Reagent Wedge R2 Vitamin B12 "D" Reagent Wedge R1 Vitamin B12 "D" Reagent Wedge R2 Vitamin B12 Adjustors	No specific treatment. No specific treatment. No specific treatment. No specific treatment. No specific treatment. Not available. Not available. Not available. Not available. Not available.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture : In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous combustion products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides
sulfur oxides
halogenated compounds
metal oxide/oxides

5.3 Advice for firefighters

Special protective actions 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.

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.

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. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. 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).

6.3 Methods and material for containment and cleaning up

SECTION 6: Accidental release measures

Small spill	: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
Large spill	: Stop leak if without risk. Move containers from spill area. Approach the release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.
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**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 vapour or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. 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 in accordance with local regulations. 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. 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
Vitamin B12 A Reagent Wedge R2	
sodium hydroxide	EH40/2005 WELs (United Kingdom (UK), 1/2020). STEL: 2 mg/m ³ 15 minutes.
disodium tetraborate decahydrate	EH40/2005 WELs (United Kingdom (UK), 1/2020). TWA: 5 mg/m ³ 8 hours.
sodium azide	EH40/2005 WELs (United Kingdom (UK), 1/2020). Absorbed through skin. STEL: 0.3 mg/m ³ , (as NaN ₃) 15 minutes. TWA: 0.1 mg/m ³ , (as NaN ₃) 8 hours.
salts of hydrogen cyanide	EH40/2005 WELs (United Kingdom (UK), 1/2020). Absorbed

SECTION 8: Exposure controls/personal protection**through skin.**STEL: 5 mg/m³, (as CN) 15 minutes.TWA: 1 mg/m³, (as CN) 8 hours.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs

Product/ingredient name	Type	Exposure	Value	Population	Effects
Vitamin B12 A Reagent Wedge R2 sodium hydroxide	DNEL	Long term Inhalation	1 mg/m ³	General population	Local
	DNEL	Long term Inhalation	1 mg/m ³	Workers	Local
disodium tetraborate decahydrate	DNEL	Short term Oral	0.79 mg/ kg bw/day	General population	Systemic
	DNEL	Long term Oral	0.79 mg/ kg bw/day	General population	Systemic
	DNEL	Long term Inhalation	3.4 mg/m ³	General population	Systemic
	DNEL	Long term Inhalation	6.7 mg/m ³	Workers	Systemic
	DNEL	Short term Inhalation	17.04 mg/ m ³	General population	Local
	DNEL	Long term Inhalation	17.04 mg/ m ³	General population	Local
	DNEL	Short term Inhalation	17.04 mg/ m ³	Workers	Local
	DNEL	Long term Inhalation	17.04 mg/ m ³	Workers	Local
	DNEL	Long term Dermal	159.5 mg/ kg bw/day	General population	Systemic
	DNEL	Long term Dermal	316.4 mg/ kg bw/day	Workers	Systemic
sodium azide	DNEL	Long term Oral	16.7 µg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	16.7 µg/kg bw/day	General population	Systemic
	DNEL	Long term Inhalation	29 µg/m ³	General population	Systemic
	DNEL	Long term Dermal	46.7 µg/kg bw/day	Workers	Systemic
salts of hydrogen cyanide	DNEL	Long term Inhalation	0.164 mg/ m ³	Workers	Systemic
	DNEL	Long term Dermal	0.14 mg/ kg bw/day	Workers	Systemic
	DNEL	Long term Inhalation	0.94 mg/m ³	Workers	Systemic
	DNEL	Short term Dermal	4.03 mg/ kg bw/day	Workers	Systemic
	DNEL	Short term Inhalation	12.5 mg/m ³	Workers	Systemic

PNECs

No PNECs available

8.2 Exposure controls

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

SECTION 8: Exposure controls/personal protection**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: chemical splash 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** : Vitamin B12 "A" Reagent Wedge R1 Liquid.
Vitamin B12 A Reagent Wedge R2 Liquid.
Vitamin B12 "D" Reagent Wedge R1 Liquid.
Vitamin B12 "D" Reagent Wedge R2 Liquid.
Vitamin B12 Adjustors Solid.
- Colour** : Vitamin B12 "A" Reagent Wedge R1 Colourless.
Vitamin B12 A Reagent Wedge R2 Not available.
Vitamin B12 "D" Reagent Wedge R1 Colourless.
Vitamin B12 "D" Reagent Wedge R2 Colourless.
Vitamin B12 Adjustors Colourless.
- Odour** : Vitamin B12 "A" Reagent Wedge R1 Odourless.
Vitamin B12 A Reagent Wedge R2 Not available.
Vitamin B12 "D" Reagent Wedge R1 Odourless.
Vitamin B12 "D" Reagent Wedge R2 Odourless.
Vitamin B12 Adjustors Odourless.
- Odour threshold** : Not relevant/applicable due to nature of the product.
- Melting point/freezing point** : Not relevant/applicable due to nature of the product.
- Softening point** : Not relevant/applicable due to nature of the product.

SECTION 9: Physical and chemical properties

Sublimation temperature	:	Not relevant/applicable due to nature of the product.
Initial boiling point and boiling range	:	Vitamin B12 "A" Reagent Wedge R1 Not available. Vitamin B12 A Reagent Wedge R2 Not available. Vitamin B12 "D" Reagent Wedge R1 Not available. Vitamin B12 "D" Reagent Wedge R2 Not available. Vitamin B12 Adjustors Not available.
Flammability (solid, gas)	:	Vitamin B12 "A" Reagent Wedge R1 Not relevant/applicable due to nature of the product. Vitamin B12 A Reagent Wedge R2 Not relevant/applicable due to nature of the product. Vitamin B12 "D" Reagent Wedge R1 Not relevant/applicable due to nature of the product. Vitamin B12 "D" Reagent Wedge R2 Not relevant/applicable due to nature of the product. Vitamin B12 Adjustors Not relevant/applicable due to nature of the product.
Upper/lower flammability or explosive limits	:	Vitamin B12 "A" Reagent Wedge R1 Not available. Vitamin B12 A Reagent Wedge R2 Not available. Vitamin B12 "D" Reagent Wedge R1 Not available. Vitamin B12 "D" Reagent Wedge R2 Not available. Vitamin B12 Adjustors Not applicable.
Flash point	:	Vitamin B12 "A" Reagent Wedge R1 [Product does not sustain combustion.] Vitamin B12 A Reagent Wedge R2 [Product does not sustain combustion.] Vitamin B12 "D" Reagent Wedge R1 [Product does not sustain combustion.] Vitamin B12 "D" Reagent Wedge R2 [Product does not sustain combustion.] Vitamin B12 Adjustors [Product does not sustain combustion.]

Ingredient name	Closed cup			Open cup		
	°C	°F	Method	°C	°F	Method
Vitamin B12 "A" Reagent Wedge R1 (R*,R*)-(±)-1,4-dimercaptobutane-2,3-diol	109	228.2				
Vitamin B12 "D" Reagent Wedge R1 Sorbitan monolaurate, ethoxylated	275	527		>149	>300.2	

Auto-ignition temperature :

Ingredient name	°C	°F	Method
Vitamin B12 A Reagent Wedge R2 sodium azide	309	588.2	EU A.16
Vitamin B12 "D" Reagent Wedge R1 sodium azide	309	588.2	EU A.16
Vitamin B12 "D" Reagent Wedge R2 sodium azide	309	588.2	EU A.16

Decomposition temperature : Not relevant/applicable due to nature of the product.

pH	:	Vitamin B12 "A" Reagent Wedge R1 Not applicable. Vitamin B12 A Reagent Wedge R2 14 Vitamin B12 "D" Reagent Wedge R1 7.45 to 7.55 Vitamin B12 "D" Reagent Wedge R2 6.95 to 7.05 Vitamin B12 Adjustors Not applicable.
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SECTION 9: Physical and chemical properties

Viscosity : Vitamin B12 "A" Reagent Wedge R1 Not available.
 Vitamin B12 A Reagent Wedge R2 Not available.
 Vitamin B12 "D" Reagent Wedge R1 Not available.
 Vitamin B12 "D" Reagent Wedge R2 Not available.
 Vitamin B12 Adjustors Not applicable.

Solubility(ies) :
 Not available.

Solubility in water : Not relevant/applicable due to nature of the product.

Miscible with water : Not relevant/applicable due to nature of the product.

Partition coefficient: n-octanol/ water : Not relevant/applicable due to nature of the product.

Vapour pressure :

Ingredient name	Vapour Pressure at 20°C			Vapour pressure at 50°C		
	mm Hg	kPa	Method	mm Hg	kPa	Method
Vitamin B12 "A" Reagent Wedge R1						
water	23.8	3.2				
Vitamin B12 A Reagent Wedge R2						
water	23.8	3.2				
Vitamin B12 "D" Reagent Wedge R1						
water	23.8	3.2				
Vitamin B12 "D" Reagent Wedge R2						
water	23.8	3.2				

Evaporation rate : Not relevant/applicable due to nature of the product.

Relative density : Vitamin B12 "A" Reagent Wedge R1 1
 Vitamin B12 A Reagent Wedge R2 Not available.
 Vitamin B12 "D" Reagent Wedge R1 1
 Vitamin B12 "D" Reagent Wedge R2 1
 Vitamin B12 Adjustors 1

Density : Vitamin B12 "A" Reagent Wedge R1 Not available.
 Vitamin B12 A Reagent Wedge R2 Not available.
 Vitamin B12 "D" Reagent Wedge R1 Not available.
 Vitamin B12 "D" Reagent Wedge R2 Not available.
 Vitamin B12 Adjustors Not available.

Vapour density : Vitamin B12 "A" Reagent Wedge R1 Not available.
 Vitamin B12 A Reagent Wedge R2 Not available.
 Vitamin B12 "D" Reagent Wedge R1 Not available.
 Vitamin B12 "D" Reagent Wedge R2 Not available.
 Vitamin B12 Adjustors Not applicable.

Explosive properties : Vitamin B12 "A" Reagent Wedge R1 Not available.
 Vitamin B12 A Reagent Wedge R2 Not available.
 Vitamin B12 "D" Reagent Wedge R1 Not available.
 Vitamin B12 "D" Reagent Wedge R2 Not available.
 Vitamin B12 Adjustors Not available.

Oxidising properties : Vitamin B12 "A" Reagent Wedge R1 Not available.
 Vitamin B12 A Reagent Wedge R2 Not available.
 Vitamin B12 "D" Reagent Wedge R1 Not available.
 Vitamin B12 "D" Reagent Wedge R2 Not available.
 Vitamin B12 Adjustors Not available.

SECTION 9: Physical and chemical properties**Particle characteristics****Median particle size** : Not applicable.**9.2 Other information**

Fire point : Vitamin B12 "A" Reagent Wedge R1 Not available.
 Vitamin B12 A Reagent Wedge R2 Not available.
 Vitamin B12 "D" Reagent Wedge R1 Not available.
 Vitamin B12 "D" Reagent Wedge R2 Not available.
 Vitamin B12 Adjustors Not available.

Burning time : Not relevant/applicable due to nature of the product.

Fundamental burning velocity : Not relevant/applicable due to nature of the product.

Burning rate : Not relevant/applicable due to nature of the product.

SADT : Not relevant/applicable due to nature of the product.

SAPT : Not relevant/applicable due to nature of the product.

Heat of reaction : Not relevant/applicable due to nature of the product.

Heat of combustion : Not relevant/applicable due to nature of the product.

Flow time (ISO 2431) : Not relevant/applicable due to nature of the product.

Molecular weight : Not relevant/applicable due to nature of the product.

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** : No specific data.**10.5 Incompatible materials** : No specific data.**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	Species	Dose	Exposure
Vitamin B12 A Reagent Wedge R2				
disodium tetraborate decahydrate	LD50 Oral	Rat	2660 mg/kg	-
sodium azide	LD50 Dermal	Rabbit	20 mg/kg	-
	LD50 Dermal	Rat	50 mg/kg	-
	LD50 Oral	Rat	27 mg/kg	-
salts of hydrogen cyanide	LD50 Oral	Rat	5 mg/kg	-

Conclusion/Summary : Vitamin B12 "A" Reagent Wedge R1 Not available.
 Vitamin B12 A Reagent Wedge R2 Not available.
 Vitamin B12 "D" Reagent Wedge R1 Not available.
 Vitamin B12 "D" Reagent Wedge R2 Not available.
 Vitamin B12 Adjustors Not available.

Acute toxicity estimates

SECTION 11: Toxicological information

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapours) (mg/l)	Inhalation (dusts and mists) (mg/l)
Vitamin B12 "A" Reagent Wedge R1 Vitamin B12 "A" Reagent Wedge R1 (R*,R*)-(±)-1,4-dimercaptobutane-2,3-diol	10000 500	N/A N/A	N/A N/A	N/A N/A	N/A N/A
Vitamin B12 A Reagent Wedge R2 disodium tetraborate decahydrate sodium azide salts of hydrogen cyanide	2660 27 5	N/A 20 5	N/A N/A N/A	N/A N/A N/A	N/A N/A 0.05

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Vitamin B12 A Reagent Wedge R2 sodium hydroxide	Eyes - Mild irritant Eyes - Severe irritant Eyes - Severe irritant Eyes - Severe irritant Eyes - Severe irritant Skin - Mild irritant Skin - Severe irritant	Rabbit Monkey Rabbit Rabbit Rabbit Human Rabbit	- - - - - - -	400 ug 24 hours 1 % 1 % 0.5 minutes 1 mg 24 hours 50 ug 24 hours 2 % 24 hours 500 mg	- - - - - - -

Conclusion/Summary

Skin	: Vitamin B12 "A" Reagent Wedge R1 Vitamin B12 A Reagent Wedge R2 Vitamin B12 "D" Reagent Wedge R1 Vitamin B12 "D" Reagent Wedge R2 Vitamin B12 Adjustors	Not available. Not available. Not available. Not available. Not available.
Eyes	: Vitamin B12 "A" Reagent Wedge R1 Vitamin B12 A Reagent Wedge R2 Vitamin B12 "D" Reagent Wedge R1 Vitamin B12 "D" Reagent Wedge R2 Vitamin B12 Adjustors	Not available. Not available. Not available. Not available. Not available.
Respiratory	: Vitamin B12 "A" Reagent Wedge R1 Vitamin B12 A Reagent Wedge R2 Vitamin B12 "D" Reagent Wedge R1 Vitamin B12 "D" Reagent Wedge R2 Vitamin B12 Adjustors	Not available. Not available. Not available. Not available. Not available.

Sensitisation**Conclusion/Summary**

Skin	: Vitamin B12 "A" Reagent Wedge R1 Vitamin B12 A Reagent Wedge R2 Vitamin B12 "D" Reagent Wedge R1 Vitamin B12 "D" Reagent Wedge R2 Vitamin B12 Adjustors	Not available. Not available. Not available. Not available. Not available.
Respiratory	: Vitamin B12 "A" Reagent Wedge R1 Vitamin B12 A Reagent Wedge R2 Vitamin B12 "D" Reagent Wedge R1 Vitamin B12 "D" Reagent Wedge R2 Vitamin B12 Adjustors	Not available. Not available. Not available. Not available. Not available.

Mutagenicity

SECTION 11: Toxicological information

Conclusion/Summary	: Vitamin B12 "A" Reagent Wedge R1	Not available.
	Vitamin B12 A Reagent Wedge R2	Not available.
	Vitamin B12 "D" Reagent Wedge R1	Not available.
	Vitamin B12 "D" Reagent Wedge R2	Not available.
	Vitamin B12 Adjustors	Not available.

Carcinogenicity

Conclusion/Summary	: Vitamin B12 "A" Reagent Wedge R1	Not available.
	Vitamin B12 A Reagent Wedge R2	Not available.
	Vitamin B12 "D" Reagent Wedge R1	Not available.
	Vitamin B12 "D" Reagent Wedge R2	Not available.
	Vitamin B12 Adjustors	Not available.

Reproductive toxicity

Conclusion/Summary	: Vitamin B12 "A" Reagent Wedge R1	Not available.
	Vitamin B12 A Reagent Wedge R2	Not available.
	Vitamin B12 "D" Reagent Wedge R1	Not available.
	Vitamin B12 "D" Reagent Wedge R2	Not available.
	Vitamin B12 Adjustors	Not available.

Teratogenicity

Conclusion/Summary	: Vitamin B12 "A" Reagent Wedge R1	Not available.
	Vitamin B12 A Reagent Wedge R2	Not available.
	Vitamin B12 "D" Reagent Wedge R1	Not available.
	Vitamin B12 "D" Reagent Wedge R2	Not available.
	Vitamin B12 Adjustors	Not available.

Specific target organ toxicity (single exposure)

Product/ingredient name	Category	Route of exposure	Target organs
Vitamin B12 "A" Reagent Wedge R1 (R*,R*)-(±)-1,4-dimercaptobutane-2,3-diol	Category 3	-	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on likely routes of exposure	: Vitamin B12 "A" Reagent Wedge R1	Not available.
	Vitamin B12 A Reagent Wedge R2	Not available.
	Vitamin B12 "D" Reagent Wedge R1	Not available.
	Vitamin B12 "D" Reagent Wedge R2	Not available.
	Vitamin B12 Adjustors	Not available.

Potential acute health effects

Eye contact	: Vitamin B12 "A" Reagent Wedge R1	No known significant effects or critical hazards.
	Vitamin B12 A Reagent Wedge R2	Causes serious eye damage.
	Vitamin B12 "D" Reagent Wedge R1	No known significant effects or critical hazards.
	Vitamin B12 "D" Reagent Wedge R2	No known significant effects or critical hazards.
	Vitamin B12 Adjustors	No known significant effects or critical hazards.
Inhalation	: Vitamin B12 "A" Reagent Wedge R1	No known significant effects or critical hazards.
	Vitamin B12 A Reagent Wedge R2	No known significant effects or critical hazards.
	Vitamin B12 "D" Reagent Wedge R1	No known significant effects or critical hazards.
	Vitamin B12 "D" Reagent Wedge R2	No known significant effects or critical hazards.

SECTION 11: Toxicological information

	Vitamin B12 Adjustors	No known significant effects or critical hazards.
Skin contact	: Vitamin B12 "A" Reagent Wedge R1	No known significant effects or critical hazards.
	Vitamin B12 A Reagent Wedge R2	Causes severe burns.
	Vitamin B12 "D" Reagent Wedge R1	No known significant effects or critical hazards.
	Vitamin B12 "D" Reagent Wedge R2	No known significant effects or critical hazards.
	Vitamin B12 Adjustors	No known significant effects or critical hazards.
Ingestion	: Vitamin B12 "A" Reagent Wedge R1	No known significant effects or critical hazards.
	Vitamin B12 A Reagent Wedge R2	No known significant effects or critical hazards.
	Vitamin B12 "D" Reagent Wedge R1	No known significant effects or critical hazards.
	Vitamin B12 "D" Reagent Wedge R2	No known significant effects or critical hazards.
	Vitamin B12 Adjustors	No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact	: Vitamin B12 "A" Reagent Wedge R1	No specific data.
	Vitamin B12 A Reagent Wedge R2	Adverse symptoms may include the following: pain watering redness
	Vitamin B12 "D" Reagent Wedge R1	No specific data.
	Vitamin B12 "D" Reagent Wedge R2	No specific data.
	Vitamin B12 Adjustors	No specific data.
Inhalation	: Vitamin B12 "A" Reagent Wedge R1	No specific data.
	Vitamin B12 A Reagent Wedge R2	No specific data.
	Vitamin B12 "D" Reagent Wedge R1	No specific data.
	Vitamin B12 "D" Reagent Wedge R2	No specific data.
	Vitamin B12 Adjustors	No specific data.
Skin contact	: Vitamin B12 "A" Reagent Wedge R1	No specific data.
	Vitamin B12 A Reagent Wedge R2	Adverse symptoms may include the following: pain or irritation redness blistering may occur
	Vitamin B12 "D" Reagent Wedge R1	No specific data.
	Vitamin B12 "D" Reagent Wedge R2	No specific data.
	Vitamin B12 Adjustors	No specific data.
Ingestion	: Vitamin B12 "A" Reagent Wedge R1	No specific data.
	Vitamin B12 A Reagent Wedge R2	Adverse symptoms may include the following: stomach pains
	Vitamin B12 "D" Reagent Wedge R1	No specific data.
	Vitamin B12 "D" Reagent Wedge R2	No specific data.
	Vitamin B12 Adjustors	No specific data.

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

Potential immediate effects	: Vitamin B12 "A" Reagent Wedge R1	Not available.
	Vitamin B12 A Reagent Wedge R2	Not available.
	Vitamin B12 "D" Reagent Wedge R1	Not available.
	Vitamin B12 "D" Reagent Wedge R2	Not available.
	Vitamin B12 Adjustors	Not available.

SECTION 11: Toxicological information

Potential delayed effects	: Vitamin B12 "A" Reagent Wedge R1	Not available.
	Vitamin B12 A Reagent Wedge R2	Not available.
	Vitamin B12 "D" Reagent Wedge R1	Not available.
	Vitamin B12 "D" Reagent Wedge R2	Not available.
	Vitamin B12 Adjustors	Not available.

Long term exposure

Potential immediate effects	: Vitamin B12 "A" Reagent Wedge R1	Not available.
	Vitamin B12 A Reagent Wedge R2	Not available.
	Vitamin B12 "D" Reagent Wedge R1	Not available.
	Vitamin B12 "D" Reagent Wedge R2	Not available.
	Vitamin B12 Adjustors	Not available.

Potential delayed effects	: Vitamin B12 "A" Reagent Wedge R1	Not available.
	Vitamin B12 A Reagent Wedge R2	Not available.
	Vitamin B12 "D" Reagent Wedge R1	Not available.
	Vitamin B12 "D" Reagent Wedge R2	Not available.
	Vitamin B12 Adjustors	Not available.

Potential chronic health effects

Not available.

Conclusion/Summary	: Vitamin B12 "A" Reagent Wedge R1	Not available.
	Vitamin B12 A Reagent Wedge R2	Not available.
	Vitamin B12 "D" Reagent Wedge R1	Not available.
	Vitamin B12 "D" Reagent Wedge R2	Not available.
	Vitamin B12 Adjustors	Not available.

General	: Vitamin B12 "A" Reagent Wedge R1	No known significant effects or critical hazards.
	Vitamin B12 A Reagent Wedge R2	No known significant effects or critical hazards.
	Vitamin B12 "D" Reagent Wedge R1	No known significant effects or critical hazards.
	Vitamin B12 "D" Reagent Wedge R2	No known significant effects or critical hazards.
	Vitamin B12 Adjustors	No known significant effects or critical hazards.

Carcinogenicity	: Vitamin B12 "A" Reagent Wedge R1	No known significant effects or critical hazards.
	Vitamin B12 A Reagent Wedge R2	No known significant effects or critical hazards.
	Vitamin B12 "D" Reagent Wedge R1	No known significant effects or critical hazards.
	Vitamin B12 "D" Reagent Wedge R2	No known significant effects or critical hazards.
	Vitamin B12 Adjustors	No known significant effects or critical hazards.

Mutagenicity	: Vitamin B12 "A" Reagent Wedge R1	No known significant effects or critical hazards.
	Vitamin B12 A Reagent Wedge R2	No known significant effects or critical hazards.
	Vitamin B12 "D" Reagent Wedge R1	No known significant effects or critical hazards.
	Vitamin B12 "D" Reagent Wedge R2	No known significant effects or critical hazards.
	Vitamin B12 Adjustors	No known significant effects or critical hazards.

Reproductive toxicity	: Vitamin B12 "A" Reagent Wedge R1	No known significant effects or critical hazards.
	Vitamin B12 A Reagent Wedge R2	May damage fertility. May damage the unborn child.
	Vitamin B12 "D" Reagent Wedge R1	No known significant effects or critical hazards.
	Vitamin B12 "D" Reagent Wedge R2	No known significant effects or critical hazards.

SECTION 11: Toxicological information

	Vitamin B12 Adjustors	No known significant effects or critical hazards.
Interactive effects	: Vitamin B12 "A" Reagent Wedge R1 Vitamin B12 A Reagent Wedge R2 Vitamin B12 "D" Reagent Wedge R1 Vitamin B12 "D" Reagent Wedge R2 Vitamin B12 Adjustors	Not available. Not available. Not available. Not available. Not available.
Toxicokinetics		
Absorption	: Vitamin B12 "A" Reagent Wedge R1 Vitamin B12 A Reagent Wedge R2 Vitamin B12 "D" Reagent Wedge R1 Vitamin B12 "D" Reagent Wedge R2 Vitamin B12 Adjustors	Not available. Not available. Not available. Not available. Not available.
Distribution	: Vitamin B12 "A" Reagent Wedge R1 Vitamin B12 A Reagent Wedge R2 Vitamin B12 "D" Reagent Wedge R1 Vitamin B12 "D" Reagent Wedge R2 Vitamin B12 Adjustors	Not available. Not available. Not available. Not available. Not available.
Metabolism	: Vitamin B12 "A" Reagent Wedge R1 Vitamin B12 A Reagent Wedge R2 Vitamin B12 "D" Reagent Wedge R1 Vitamin B12 "D" Reagent Wedge R2 Vitamin B12 Adjustors	Not available. Not available. Not available. Not available. Not available.
Elimination	: Vitamin B12 "A" Reagent Wedge R1 Vitamin B12 A Reagent Wedge R2 Vitamin B12 "D" Reagent Wedge R1 Vitamin B12 "D" Reagent Wedge R2 Vitamin B12 Adjustors	Not available. Not available. Not available. Not available. Not available.
Other information	: Vitamin B12 "A" Reagent Wedge R1 Vitamin B12 A Reagent Wedge R2 Vitamin B12 "D" Reagent Wedge R1 Vitamin B12 "D" Reagent Wedge R2 Vitamin B12 Adjustors	Not available. Not available. Not available. Not available. Not available.

SECTION 12: Ecological information**12.1 Toxicity**

Product/ingredient name	Result	Species	Exposure
Vitamin B12 A Reagent Wedge R2 sodium hydroxide disodium tetraborate decahydrate sodium azide	Acute EC50 40.38 mg/l Fresh water	Crustaceans - Water flea - Ceriodaphnia dubia - Neonate	48 hours
	Acute LC50 125 ppm Fresh water	Fish - Western mosquitofish - Gambusia affinis - Adult	96 hours
	Acute EC50 1645 mg/l Fresh water	Crustaceans - Ostracod - Cypris subglobosa	48 hours
	Acute EC50 9200 µg/l Marine water	Algae - Giant kelp - Macrocystis pyrifera	96 hours
	Acute EC50 6.4 mg/l Fresh water	Crustaceans - Water flea - Simocephalus serrulatus - Larvae	48 hours
	Acute EC50 4.2 mg/l Fresh water	Daphnia - Water flea - Daphnia pulex - Larvae	48 hours
	Acute LC50 0.68 mg/l Fresh water	Fish - Bluegill - Lepomis macrochirus	96 hours
	Chronic NOEC 5600 µg/l Marine water	Algae - Giant kelp - Macrocystis pyrifera	96 hours
salts of hydrogen cyanide	Acute EC50 0.331 mg/l Fresh water	Algae - Green algae - Chlamydomonas reinhardtii - Exponential growth phase	72 hours

SECTION 12: Ecological information

	Acute LC50 64.4 µg/l Marine water	Crustaceans - Rock crab - Cancer irroratus - Zoea	48 hours
	Acute LC50 1 µg/l Fresh water	Daphnia - Water flea - Daphnia pulex	48 hours
	Acute LC50 0.03 mg/l Marine water	Fish - Cobia - Rachycentron canadum - Young	96 hours
	Chronic EC10 0.158 mg/l Fresh water	Algae - Green algae - Chlamydomonas reinhardtii - Exponential growth phase	72 hours
	Chronic NOEC 0.05 mg/l Fresh water	Fish - Zambezi barbel - Clarias gariepinus - Adult	4 weeks

Conclusion/Summary	: Vitamin B12 "A" Reagent Wedge R1	Not available.
	Vitamin B12 A Reagent Wedge R2	Not available.
	Vitamin B12 "D" Reagent Wedge R1	Not available.
	Vitamin B12 "D" Reagent Wedge R2	Not available.
	Vitamin B12 Adjustors	Not available.

12.2 Persistence and degradability

Conclusion/Summary	: Vitamin B12 "A" Reagent Wedge R1	Not available.
	Vitamin B12 A Reagent Wedge R2	Not available.
	Vitamin B12 "D" Reagent Wedge R1	Not available.
	Vitamin B12 "D" Reagent Wedge R2	Not available.
	Vitamin B12 Adjustors	Not available.

12.3 Bioaccumulative potential

Not available.

12.4 Mobility in soil

Soil/water partition coefficient (K_{oc})	: Vitamin B12 "A" Reagent Wedge R1	Not available.
	Vitamin B12 A Reagent Wedge R2	Not available.
	Vitamin B12 "D" Reagent Wedge R1	Not available.
	Vitamin B12 "D" Reagent Wedge R2	Not available.
	Vitamin B12 Adjustors	Not available.
Mobility	: Vitamin B12 "A" Reagent Wedge R1	Not available.
	Vitamin B12 A Reagent Wedge R2	Not available.
	Vitamin B12 "D" Reagent Wedge R1	Not available.
	Vitamin B12 "D" Reagent Wedge R2	Not available.
	Vitamin B12 Adjustors	Not available.

12.5 Results of PBT and vPvB assessment

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

12.6 Other adverse effects : No known significant effects or critical hazards.**SECTION 13: Disposal considerations****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. Sodium azide may react with lead or copper plumbing to form highly explosive metal azides.

SECTION 13: Disposal considerations**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**

14.1 UN number	Vitamin B12 "A" Reagent Wedge R1	Not regulated.
	Vitamin B12 A Reagent Wedge R2	UN1824
	Vitamin B12 "D" Reagent Wedge R1	Not regulated.
	Vitamin B12 "D" Reagent Wedge R2	Not regulated.
	Vitamin B12 Adjustors	Not regulated.
14.2 UN proper shipping name	Vitamin B12 "A" Reagent Wedge R1	-
	Vitamin B12 A Reagent Wedge R2	Sodium hydroxide solution
	Vitamin B12 "D" Reagent Wedge R1	-
	Vitamin B12 "D" Reagent Wedge R2	-
	Vitamin B12 Adjustors	-
14.3 Transport hazard class(es)	Vitamin B12 "A" Reagent Wedge R1	-
	Vitamin B12 A Reagent Wedge R2	8
	Vitamin B12 "D" Reagent Wedge R1	-
	Vitamin B12 "D" Reagent Wedge R2	-
	Vitamin B12 Adjustors	-
14.4 Packing group	Vitamin B12 "A" Reagent Wedge R1	-
	Vitamin B12 A Reagent Wedge R2	II
	Vitamin B12 "D" Reagent Wedge R1	-
	Vitamin B12 "D" Reagent Wedge R2	-
	Vitamin B12 Adjustors	-
14.5 Environmental hazards	Vitamin B12 "A" Reagent Wedge R1	No.
	Vitamin B12 A Reagent Wedge R2	No.
	Vitamin B12 "D" Reagent Wedge R1	No.
	Vitamin B12 "D" Reagent Wedge R2	No.
	Vitamin B12 Adjustors	No.
Additional information	Vitamin B12 "A" Reagent Wedge R1	-
	Vitamin B12 A Reagent Wedge R2	-
	Vitamin B12 "D" Reagent Wedge R1	-
	Vitamin B12 "D" Reagent Wedge R2	-
	Vitamin B12 Adjustors	-

ADN

14.1 UN number	Vitamin B12 "A" Reagent Wedge R1	Not regulated.
	Vitamin B12 A Reagent Wedge R2	UN1824
	Vitamin B12 "D" Reagent Wedge R1	Not regulated.
	Vitamin B12 "D" Reagent Wedge R2	Not regulated.
	Vitamin B12 Adjustors	Not regulated.
14.2 UN proper shipping name	Vitamin B12 "A" Reagent Wedge R1	-
	Vitamin B12 A Reagent Wedge R2	Sodium hydroxide solution
	Vitamin B12 "D" Reagent Wedge R1	-
	Vitamin B12 "D" Reagent Wedge R2	-
	Vitamin B12 Adjustors	-

SECTION 14: Transport information

14.3 Transport hazard class(es)	Vitamin B12 "A" Reagent Wedge R1	-
	Vitamin B12 A Reagent Wedge R2	8
	Vitamin B12 "D" Reagent Wedge R1	-
	Vitamin B12 "D" Reagent Wedge R2	-
	Vitamin B12 Adjustors	-

14.4 Packing group	Vitamin B12 "A" Reagent Wedge R1	-
	Vitamin B12 A Reagent Wedge R2	II
	Vitamin B12 "D" Reagent Wedge R1	-
	Vitamin B12 "D" Reagent Wedge R2	-
	Vitamin B12 Adjustors	-

14.5 Environmental hazards	Vitamin B12 "A" Reagent Wedge R1	No.
	Vitamin B12 A Reagent Wedge R2	No.
	Vitamin B12 "D" Reagent Wedge R1	No.
	Vitamin B12 "D" Reagent Wedge R2	No.
	Vitamin B12 Adjustors	No.

Additional information	Vitamin B12 "A" Reagent Wedge R1	-
	Vitamin B12 A Reagent Wedge R2	-
	Vitamin B12 "D" Reagent Wedge R1	-
	Vitamin B12 "D" Reagent Wedge R2	-
	Vitamin B12 Adjustors	-

IMDG

14.1 UN number	Vitamin B12 "A" Reagent Wedge R1	Not regulated.
	Vitamin B12 A Reagent Wedge R2	UN1824
	Vitamin B12 "D" Reagent Wedge R1	Not regulated.
	Vitamin B12 "D" Reagent Wedge R2	Not regulated.
	Vitamin B12 Adjustors	Not regulated.
14.2 UN proper shipping name	Vitamin B12 "A" Reagent Wedge R1	-
	Vitamin B12 A Reagent Wedge R2	SODIUM HYDROXIDE, SOLUTION
	Vitamin B12 "D" Reagent Wedge R1	-
	Vitamin B12 "D" Reagent Wedge R2	-
	Vitamin B12 Adjustors	-
14.3 Transport hazard class(es)	Vitamin B12 "A" Reagent Wedge R1	-
	Vitamin B12 A Reagent Wedge R2	8
	Vitamin B12 "D" Reagent Wedge R1	-
	Vitamin B12 "D" Reagent Wedge R2	-
	Vitamin B12 Adjustors	-

14.4 Packing group	Vitamin B12 "A" Reagent Wedge R1	-
	Vitamin B12 A Reagent Wedge R2	II
	Vitamin B12 "D" Reagent Wedge R1	-
	Vitamin B12 "D" Reagent Wedge R2	-
	Vitamin B12 Adjustors	-

14.5 Environmental hazards	Vitamin B12 "A" Reagent Wedge R1	No.
	Vitamin B12 A Reagent Wedge R2	No.
	Vitamin B12 "D" Reagent Wedge R1	No.
	Vitamin B12 "D" Reagent Wedge R2	No.
	Vitamin B12 Adjustors	No.

Additional information	Vitamin B12 "A" Reagent Wedge R1	-
	Vitamin B12 A Reagent Wedge R2	-
	Vitamin B12 "D" Reagent Wedge R1	-
	Vitamin B12 "D" Reagent Wedge R2	-
	Vitamin B12 Adjustors	-

IATA

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14.1 UN number	Vitamin B12 "A" Reagent Wedge R1	Not regulated.
	Vitamin B12 A Reagent Wedge R2	UN1824
	Vitamin B12 "D" Reagent Wedge R1	Not regulated.
	Vitamin B12 "D" Reagent Wedge R2	Not regulated.
	Vitamin B12 Adjustors	Not regulated.
14.2 UN proper shipping name	Vitamin B12 "A" Reagent Wedge R1	-
	Vitamin B12 A Reagent Wedge R2	SODIUM HYDROXIDE, SOLUTION
	Vitamin B12 "D" Reagent Wedge R1	-
	Vitamin B12 "D" Reagent Wedge R2	-
	Vitamin B12 Adjustors	-
14.3 Transport hazard class(es)	Vitamin B12 "A" Reagent Wedge R1	-
	Vitamin B12 A Reagent Wedge R2	8
	Vitamin B12 "D" Reagent Wedge R1	-
	Vitamin B12 "D" Reagent Wedge R2	-
	Vitamin B12 Adjustors	-
14.4 Packing group	Vitamin B12 "A" Reagent Wedge R1	-
	Vitamin B12 A Reagent Wedge R2	II
	Vitamin B12 "D" Reagent Wedge R1	-
	Vitamin B12 "D" Reagent Wedge R2	-
	Vitamin B12 Adjustors	-
14.5 Environmental hazards	Vitamin B12 "A" Reagent Wedge R1	No.
	Vitamin B12 A Reagent Wedge R2	No.
	Vitamin B12 "D" Reagent Wedge R1	No.
	Vitamin B12 "D" Reagent Wedge R2	No.
	Vitamin B12 Adjustors	No.
Additional information	Vitamin B12 "A" Reagent Wedge R1	-
	Vitamin B12 A Reagent Wedge R2	-
	Vitamin B12 "D" Reagent Wedge R1	-
	Vitamin B12 "D" Reagent Wedge R2	-
	Vitamin B12 Adjustors	-
14.6 Special precautions for user	Vitamin B12 "A" Reagent Wedge R1	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.
	Vitamin B12 A Reagent Wedge R2	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.
	Vitamin B12 "D" Reagent Wedge R1	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.
	Vitamin B12 "D" Reagent Wedge R2	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.
	Vitamin B12 Adjustors	Transport within user's premises: always transport in closed containers

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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 applicable.

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
Vitamin B12 A Reagent Wedge R2 Toxic to reproduction	disodium tetraborate, anhydrous	Candidate	-	6/18/2010

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

: Vitamin B12 "A" Reagent Wedge R1	Not applicable.
: Vitamin B12 A Reagent Wedge R2	Restricted to professional users.
: Vitamin B12 "D" Reagent Wedge R1	Not applicable.
: Vitamin B12 "D" Reagent Wedge R2	Not applicable.
: Vitamin B12 Adjustors	Not applicable.

Not applicable.
Restricted to professional users.
Not applicable.
Not applicable.
Not applicable.

Seveso Directive

This product is not controlled under the Seveso Directive.

National regulations**EU regulations**

Industrial emissions (integrated pollution prevention and control) - Air	: Vitamin B12 "A" Reagent Wedge R1	Not listed
	: Vitamin B12 A Reagent Wedge R2	Not listed
	: Vitamin B12 "D" Reagent Wedge R1	Not listed
	: Vitamin B12 "D" Reagent Wedge R2	Not listed
	: Vitamin B12 Adjustors	Not listed
Industrial emissions (integrated pollution prevention and control) - Water	: Vitamin B12 "A" Reagent Wedge R1	Not listed
	: Vitamin B12 A Reagent Wedge R2	Not listed
	: Vitamin B12 "D" Reagent Wedge R1	Not listed
	: Vitamin B12 "D" Reagent Wedge R2	Not listed
	: Vitamin B12 Adjustors	Not listed

International regulations**Montreal Protocol**

Not listed.

Stockholm Convention on Persistent Organic Pollutants

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Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

15.2 Chemical safety assessment : Not applicable.**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
Vitamin B12 A Reagent Wedge R2 Met. Corr. 1, H290 Skin Corr. 1, H314 Eye Dam. 1, H318 Repr. 1B, H360FD	On basis of test data On basis of test data On basis of test data Calculation method

Full text of abbreviated H statements

Vitamin B12 "A" Reagent Wedge R1	
H302	Harmful if swallowed.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
Vitamin B12 A Reagent Wedge R2	
H290	May be corrosive to metals.
H300	Fatal if swallowed.
H310	Fatal in contact with skin.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H330	Fatal if inhaled.
H360FD	May damage fertility. May damage the unborn child.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
EUH032	Contact with acids liberates very toxic gas.

Full text of classifications

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Vitamin B12 "A"

Reagent Wedge R1

Acute Tox. 4	ACUTE TOXICITY - Category 4
Eye Irrit. 2	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2
Skin Irrit. 2	SKIN CORROSION/IRRITATION - Category 2
STOT SE 3	SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE - Category 3

Vitamin B12 A

Reagent Wedge R2

Acute Tox. 1	ACUTE TOXICITY - Category 1
Acute Tox. 2	ACUTE TOXICITY - Category 2
Aquatic Acute 1	SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 1
Aquatic Chronic 1	LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 1
Eye Dam. 1	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1
Met. Corr. 1	CORROSIVE TO METALS - Category 1
Repr. 1B	REPRODUCTIVE TOXICITY - Category 1B
Skin Corr. 1	SKIN CORROSION/IRRITATION - Category 1
Skin Corr. 1A	SKIN CORROSION/IRRITATION - Category 1A

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Version	: 1

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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.