Vitamin B12 Assay, Reagent 1A, Reagent 1B, Reagent 2, Reagent 3, and Reagent 4
Safety Data Sheet

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

1.1. Product identifier

<table>
<thead>
<tr>
<th>Product form</th>
<th>Mixture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product name</td>
<td>Vitamin B12 Assay, Reagent 1A, Reagent 1B, Reagent 2, Reagent 3, and Reagent 4</td>
</tr>
<tr>
<td>Product code</td>
<td>DZ689A, DZ689A-R1A, DZ689A-R1B, DZ689A-R2, DZ689A-R3, DZ689A-R4</td>
</tr>
<tr>
<td>Product group</td>
<td>Trade product</td>
</tr>
</tbody>
</table>

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

1.2.1. Relevant identified uses

No additional information available

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Supplier: Diazyme Laboratories
12889 Gregg Court
92064 Poway
T 858-455-4768

Authorized Representative: MDSS GmbH
Schiffgraben 41
Germany
(+49) 511-6262-8630

1.4. Emergency telephone number

Emergency number
Contact your local health authority or poison control center in an emergency. Manufacturer contact number for the US is as follows: (858) 455-4768

SECTION 2 Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

| Met. Corr. 1 | H290 |
| Skin Corr. 1B | H314 |

Full text of H-phrases: see section 16

2.2. Label elements

Labeling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP)

Signal word (CLP) | Danger |
Hazardous ingredients | sodium hydroxide, 20%<conc<30%, aqueous solutions, tris(2-carboxyethyl)phosphine hydrochloride |
Hazard statements (CLP) | H290 - May be corrosive to metals |
| H314 - Causes severe skin burns and eye damage |
Precautionary statements (CLP) | P234 - Keep only in original container |
| P264 - Wash ... thoroughly after handling |
| P280 - Wear protective gloves/protective clothing/eye protection/face protection |
| P301+P330+P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting |
| P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower |
| P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing |
| P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing |
| P310 - Immediately call a POISON CENTER/doctor/… |
Vitamin B12 Assay, Reagent 1A, Reagent 1B, Reagent 2, Reagent 3, and Reagent 4 Safety Data Sheet

according to Regulation (EC) No. 453/2010

Date of issue: 9/9/16
Revision date: 10/11/16
Version: A

Full text of H-phrases: see section 16

2.3. Other hazards

Adverse physicochemical, human health and environmental effects

May be corrosive to metals. Causes severe skin burns and eye damage.

SECTION 3 Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>Classification according to Regulation (EC) No. 1272/2008 [CLP]</th>
</tr>
</thead>
<tbody>
<tr>
<td>sodium hydroxide, 20%=&lt;conc&lt;30%, aqueous solutions (Reagent 1a)</td>
<td>(CAS No) 1310-73-2 (EC no) 215-185-5 (EC index no) 011-002-00-6</td>
<td>3.56</td>
<td>Skin Corr. 1A, H314</td>
</tr>
<tr>
<td>tris(2-carboxyethyl)phosphine hydrochloride (Reagent 1b)</td>
<td>(CAS No) 51805-45-9</td>
<td>2.86</td>
<td>Skin Corr. 1B, H314</td>
</tr>
<tr>
<td>CHES (Reagent 3)</td>
<td>(CAS No) 103-47-9 (EC no) 203-115-6</td>
<td>1.035</td>
<td>Eye Irrit. 2, H319 STOT SE 3, H335 Skin Irrit. 2, H315</td>
</tr>
<tr>
<td>Sodium azide</td>
<td>(CAS No) 26628-22-8 (EC no) 247-852-1 (EC index no) 011-004-00-7</td>
<td>0.1</td>
<td>Acute Tox. 2 (Oral), H300 Aquatic Acute 1, H400 Aquatic Chronic 1, H410</td>
</tr>
</tbody>
</table>

Full text of H-phrases: see section 16

SECTION 4 First aid measures

4.1. Description of first aid measures

First-aid measures general
Call a physician immediately.

First-aid measures after inhalation
Remove person to fresh air and keep comfortable for breathing.

First-aid measures after skin contact
Rinse skin with water/shower. Remove/Take off immediately all contaminated clothing. Call a physician immediately.

First-aid measures after eye contact
Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician immediately.

First-aid measures after ingestion
Rinse mouth. Do not induce vomiting. Call a physician immediately.

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

Symptoms/injuries after skin contact
Burns.

Symptoms/injuries after eye contact
Serious damage to eyes.

Symptoms/injuries after ingestion
Burns.

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

Treat symptomatically.

SECTION 5 Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition products in case of fire
Toxic fumes may be released.

5.3. Advice for firefighters

Protection during firefighting
Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.
Vitamin B12 Assay, Reagent 1A, Reagent 1B, Reagent 2, Reagent 3, and Reagent 4
Safety Data Sheet

according to Regulation (EC) No. 453/2010

Date of issue 9/9/16  Revision date 10/11/06  Version A

SECTION 6 Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures
Ventilate spillage area. Avoid contact with skin and eyes. Do not breathe dust/fume/gas/mist/vapors/spray.

6.1.2. For emergency responders

Protective equipment
Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up
Take up liquid spill into absorbent material.

Other information
Dispose of materials or solid residues at an authorized site.

6.4. Reference to other sections

For further information refer to section 13.

SECTION 7 Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling
Ensure good ventilation of the work station. Avoid contact with skin and eyes. Do not breathe dust/fume/gas/mist/vapors/spray. Wear personal protective equipment.

Hygiene measures
Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions
Store in corrosive resistant container with a resistant inner liner. Keep only in original container. Store locked up. Store in a well-ventilated place. Keep cool.

Incompatible materials
Metals.

7.3. Specific end use(s)

No additional information available

SECTION 8 Exposure controls/personal protection

8.1. Control parameters

| sodium hydroxide, 20%=<conc<30%, aqueous solutions (1310-73-2) |
|-----------------------|--------------------------|----------------------|
| Spain                 | Local name               | Hidróxido de sodio   |
| Spain                 | VLA-EC (mg/m³)           | 2 mg/m³              |
| USA - ACGIH           | Local name               | Sodium hydroxide     |
| USA - ACGIH           | ACGIH Ceiling (mg/m³)    | 2 mg/m³              |
| USA - ACGIH           | Remark (ACGIH)           | URT, eye, & skin irr |
| USA - OSHA            | Local name               | Sodium hydroxide     |
| USA - OSHA            | OSHA PEL (TWA) (mg/m³)   | 2 mg/m³              |

Sodium azide (26628-22-8)

| EU                     | IOELV TWA (mg/m³)         | 0.1 mg/m³ (Sodium azide; EU; Time-weighted average exposure limit 8 h; Indicative occupational exposure limit value) |
| EU                     | IOELV STEL (mg/m³)        | 0.3 mg/m³ (Sodium azide; EU; Short time value; Indicative occupational exposure limit value) |
| Belgium                | Limit value (mg/m³)       | 0.1 mg/m³ (Sodium (azoture de); Belgium; Time-weighted average exposure limit 8 h) |
| Belgium                | Short time value (mg/m³)  | 0.3 mg/m³ (Sodium (azoture de); Belgium; Short time value) |
| France                 | VME (mg/m³)               | 0.1 mg/m³ (Azide de sodium; France; Time-weighted average exposure limit 8 h; VRC: Valeur réglementaire contraignante) |
| France                 | VLE (mg/m³)               | 0.3 mg/m³ (Azide de sodium; France; Short time value; VRC: Valeur réglementaire contraignante) |
| Germany                | Local name               | Natriumazid          |
| Germany                | TRGS 900 Occupational exposure limit value (mg/m³) | 0.2 mg/m³ |
| Germany                | Remark (TRGS 900)         | DFG,EU               |
| Italy                  | Local name               | Azoturo di sodio     |
| Italy                  | OEL TWA (mg/m³)           | 0.1 mg/m³            |
8.2. Exposure controls

Appropriate engineering controls
Ensure good ventilation of the work station.

Hand protection
Protective gloves

Eye protection
Safety glasses

Skin and body protection
Wear suitable protective clothing

Respiratory protection
In case of insufficient ventilation, wear suitable respiratory equipment

Environmental exposure controls
Avoid release to the environment.

SECTION 9 Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state
Liquid

Color
No data available

Odor
No data available

Odor threshold
No data available

pH
No data available
Vitamin B12 Assay, Reagent 1A, Reagent 1B, Reagent 2, Reagent 3, and Reagent 4
Safety Data Sheet

according to Regulation (EC) No. 453/2010

<table>
<thead>
<tr>
<th>Date of issue</th>
<th>Revision date</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/9/16</td>
<td>10/11/16</td>
<td>A</td>
</tr>
</tbody>
</table>

Relative evaporation rate (butyl acetate=1)  No data available
Melting point  Not applicable
Freezing point  No data available
Boiling point  No data available
Flash point  No data available
Auto-ignition temperature  No data available
Decomposition temperature  No data available
Flammability (solid, gas)  Not applicable
Vapor pressure  No data available
Relative vapor density at 20 °C  No data available
Relative density  No data available
Solubility  No data available
Log Pow  No data available
Viscosity, kinematic  No data available
Viscosity, dynamic  No data available
Explosive properties  No data available
Oxidizing properties  No data available
Explosion limits  No data available

9.2. Other information
No additional information available

SECTION 10 Stability and reactivity

10.1. Reactivity
The product is non-reactive under normal conditions of use, storage and transport.

10.2. Chemical stability
Stable under normal conditions.

10.3. Possibility of hazardous reactions
No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid
None under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials
metals.

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  Not classified

<table>
<thead>
<tr>
<th>tris(2-carboxyethyl)phosphine hydrochloride (51805-45-9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD50 oral rat 3500 mg/kg (Rat)</td>
</tr>
<tr>
<td>LD50 dermal rat &gt; 3000 mg/kg (Rat)</td>
</tr>
</tbody>
</table>

Skin corrosion/irritation  Causes severe skin burns and eye damage.
Serious eye damage/irritation  Eye damage, category 1, implicit
Respiratory or skin sensitization  Not classified
Germ cell mutagenicity  Not classified
Carcinogenicity  Not classified
Reproductive toxicity  Not classified
Specific target organ toxicity (single exposure)  Not classified
Specific target organ toxicity (repeated exposure)  Not classified
Aspiration hazard  Not classified

SECTION 12 Ecological information

12.1. Toxicty
Ecology - general  Before neutralisation, the product may represent a danger to aquatic organisms.
Vitamin B12 Assay, Reagent 1A, Reagent 1B, Reagent 2, Reagent 3, and Reagent 4 
Safety Data Sheet

according to Regulation (EC) No. 453/2010

Date of issue 9/9/16  Revision date 10/11/16  Version A

**Sodium azide (26628-22-8)**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50 fish 1</td>
<td>0.8 mg/l (LC50; 96 h)</td>
</tr>
<tr>
<td>EC50 Daphnia 1</td>
<td>4.2 mg/l (EC50; 48 h)</td>
</tr>
</tbody>
</table>

**12.2. Persistence and degradability**

**Sodium hydroxide, 20%<=conc<30%, aqueous solutions (1310-73-2)**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Persistence and degradability</td>
<td>Biodegradability: not applicable. No (test)data on mobility of the components available.</td>
</tr>
</tbody>
</table>

**CHES (103-47-9)**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Persistence and degradability</td>
<td>Biodegradability in water: no data available.</td>
</tr>
</tbody>
</table>

**Sodium azide (26628-22-8)**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Persistence and degradability</td>
<td>Biodegradability: not applicable.</td>
</tr>
<tr>
<td>Biochemical oxygen demand (BOD)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Chemical oxygen demand (COD)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>ThOD</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

**tris(2-carboxyethyl)phosphine hydrochloride (51805-45-9)**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Persistence and degradability</td>
<td>Biodegradability in water: no data available.</td>
</tr>
</tbody>
</table>

**12.3. Bioaccumulative potential**

**Sodium hydroxide, 20%<=conc<30%, aqueous solutions (1310-73-2)**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bioaccumulative potential</td>
<td>Does not contain bioaccumulative component(s).</td>
</tr>
</tbody>
</table>

**CHES (103-47-9)**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bioaccumulative potential</td>
<td>No bioaccumulation data available.</td>
</tr>
</tbody>
</table>

**Sodium azide (26628-22-8)**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bioaccumulative potential</td>
<td>Not bioaccumulative.</td>
</tr>
</tbody>
</table>

**tris(2-carboxyethyl)phosphine hydrochloride (51805-45-9)**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bioaccumulative potential</td>
<td>No bioaccumulation data available.</td>
</tr>
</tbody>
</table>

**12.4. Mobility in soil**

No additional information available

**12.5. Results of PBT and vPvB assessment**

No additional information available

**12.6. Other adverse effects**

No additional information available

**SECTION 13 Disposal considerations**

**13.1. Waste treatment methods**

Waste treatment methods
Dispose of contents/container in accordance with licensed collector’s sorting instructions.

**SECTION 14 Transport information**

In accordance with ADR / RID / IMDG / IATA / ADN

**14.1. UN number**

Not regulated for transport

**14.2. UN proper shipping name**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Proper Shipping Name (ADR)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Proper Shipping Name (IMDG)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Proper Shipping Name (IATA)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Proper Shipping Name (ADN)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Proper Shipping Name (RID)</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

**14.3. Transport hazard class(es)**

**ADR**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport hazard class(es) (ADR)</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

**IMDG**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport hazard class(es) (IMDG)</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

**IATA**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport hazard class(es) (IATA)</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>
Vitamin B12 Assay, Reagent 1A, Reagent 1B, Reagent 2, Reagent 3, and Reagent 4
Safety Data Sheet

according to Regulation (EC) No. 453/2010

Date of issue 9/9/16        Revision date 10/11/16        Version A

ADN
Transport hazard class(es) (ADN) Not applicable

RID
Transport hazard class(es) (RID) Not applicable

14.4. Packing group
Packing group (ADR) Not applicable
Packing group (IMDG) Not applicable
Packing group (IATA) Not applicable
Packing group (ADN) Not applicable
Packing group (RID) Not applicable

14.5. Environmental hazards
Dangerous for the environment No
Marine pollutant No
Other information No supplementary information available

14.6. Special precautions for user
- Overland transport
No data available
- Transport by sea
No data available
- Air transport
No data available
- Inland waterway transport
Carriage prohibited (ADN) No
Not subject to ADN No
- Rail transport
Carriage prohibited (RID) No

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable

SECTION 15 Regulatory information

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

15.1.1. EU-Regulations
Contains no REACH substances with Annex XVII restrictions
Contains no REACH candidate substance
Contains no REACH Annex XIV substances.

15.1.2. National regulations

Germany
VwVwS Annex reference Water hazard class (WGK) 3, strongly hazardous to water (Classification according to VwVwS, Annex 4)

Netherlands
SZW-lijst van kankerverwekkende stoffen None of the components are listed
SZW-lijst van mutagene stoffen None of the components are listed
NIET-limietlieste lijst van voor de voortplanting giftige stoffen – Borstvoeding None of the components are listed
NIET-limietlieste lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid None of the components are listed
Vitamin B12 Assay, Reagent 1A, Reagent 1B, Reagent 2, Reagent 3, and Reagent 4
Safety Data Sheet

according to Regulation (EC) No. 453/2010

Date of issue 9/9/16
Revision date 10/11/16
Version A

NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Ontwikkeling
None of the components are listed

Denmark
Recommendations Danish Regulation
Young people below the age of 18 years are not allowed to use the product

15.2. Chemical safety assessment
No chemical safety assessment has been carried out

SECTION 16 Other information

Full text of H- and EUH-phrases

<table>
<thead>
<tr>
<th>Acute Tox. 2 (Oral)</th>
<th>Acute toxicity (oral) Category 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquatic Acute 1</td>
<td>Hazardous to the aquatic environment - Acute Hazard Category 1</td>
</tr>
<tr>
<td>Aquatic Chronic 1</td>
<td>Hazardous to the aquatic environment - Chronic Hazard Category 1</td>
</tr>
<tr>
<td>Eye Irrit. 2</td>
<td>Serious eye damage/eye irritation Category 2</td>
</tr>
<tr>
<td>Met. Corr. 1</td>
<td>Corrosive to metals Category 1</td>
</tr>
<tr>
<td>Skin Corr. 1A</td>
<td>Skin corrosion/irritation Category 1A</td>
</tr>
<tr>
<td>Skin Corr. 1B</td>
<td>Skin corrosion/irritation Category 1B</td>
</tr>
<tr>
<td>Skin Irrit. 2</td>
<td>Skin corrosion/irritation Category 2</td>
</tr>
<tr>
<td>STOT SE 3</td>
<td>Specific target organ toxicity (single exposure) Category 3</td>
</tr>
<tr>
<td>H290</td>
<td>May be corrosive to metals</td>
</tr>
<tr>
<td>H300</td>
<td>Fatal if swallowed</td>
</tr>
<tr>
<td>H314</td>
<td>Causes severe skin burns and eye damage</td>
</tr>
<tr>
<td>H315</td>
<td>Causes skin irritation</td>
</tr>
<tr>
<td>H319</td>
<td>Causes serious eye irritation</td>
</tr>
<tr>
<td>H335</td>
<td>May cause respiratory irritation</td>
</tr>
<tr>
<td>H400</td>
<td>Very toxic to aquatic life</td>
</tr>
<tr>
<td>H410</td>
<td>Very toxic to aquatic life with long lasting effects</td>
</tr>
</tbody>
</table>

SDS EU Diazyme with CLP

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.