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

1.1. Product identifier

Product form : Mixture
Trade name : Hygromycin B
EC-No. : 250-545-5
CAS-No. : 31282-04-9
Product code : H0192
Formula : C20H37N3O13
Synonyms : O-6-Amino-6-deoxy-L-glycero-D-galacto-heptopyranosylidene-(1-2-3)-O-β-D-talopyranosyl(1-5)-2-deoxy-N3-methyl-D-streptamine
Product group : Raw material

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

1.2.1. Relevant identified uses

Main use category : Professional use
Industrial/Professional use spec : For professional use only. Duchefa Biochemie B.V. products are intended only for "in vitro laboratory" research purposes.

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Supplier
Duchefa Biochemie B.V.
A. Hofmanweg 71
2031 BH Haarlem - The Netherlands
T +31(0)23-5319093 - F +31(0)23-5318027
info@duchefa.nl

1.4. Emergency telephone number

Emergency number : Supplier contact information:
+31(0)23-5319093 (M-F 09:00-17:00)
+31(0)6-30109355 (outside office hours)

<table>
<thead>
<tr>
<th>Organisation/Company</th>
<th>Address</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>World Health Organization world directory of poison centres</td>
<td><a href="http://apps.who.int/poisoncentres/">http://apps.who.int/poisoncentres/</a></td>
<td>Consult website for a local poison centre</td>
</tr>
</tbody>
</table>

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

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

Acute toxicity (oral), Category 1 : H300
Acute toxicity (dermal), Category 1 : H310
Acute toxicity (inhal.), Category 2 : H330
Skin corrosion/irritation, Category 2 : H315
Serious eye damage/eye irritation, Category 1 : H318
Specific target organ toxicity — Single exposure, Category 3, : H335
Respiratory tract irritation
Full text of hazard classes and H-statements: see section 16

Adverse physicochemical, human health and environmental effects
No additional information available

2.2. Label elements
Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP):

- GHS05
- GHS06

Signal word (CLP): Danger

Hazardous ingredients: Hygromycin B

Hazard statements (CLP):
- H300+H310+H330 - Fatal if swallowed, in contact with skin or if inhaled
- H315 - Causes skin irritation.
- H318 - Causes serious eye damage.
- H335 - May cause respiratory irritation.

Precautionary statements (CLP):
- P280 - Wear protective gloves, protective clothing, eye protection, face shield
- P260 - Do not breathe dust, fume, gas, mist, spray, vapours
- P308+P310 - IF exposed or concerned: Immediately call a POISON CENTER or doctor/physician
- P235 - Keep cool

2.3. Other hazards
No additional information available

SECTION 3: Composition/information on ingredients

3.1. Substances
Not applicable

3.2. Mixtures
Comments: 1 vial = 1 x 10^6 units preparation.

<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>Hygromycin B</td>
<td>(CAS-No.) 31282-04-9 (EC-No.) 250-545-5</td>
<td>&lt; 25</td>
<td>Acute Tox. 1 (Oral), H300 Acute Tox. 2 (Inhalation), H330 Skin Irrit. 2, H315 Eye Dam. 1, H318 STOT SE 3, H335</td>
</tr>
<tr>
<td>Water</td>
<td>(CAS-No.) 7732-18-5 (EC-No.) 231-791-2</td>
<td>&gt; 25</td>
<td>Not classified</td>
</tr>
</tbody>
</table>

Full text of H-statements: see section 16
SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation: Immediately call a POISON CENTER or doctor/physician. Remove victim to fresh air.

First-aid measures after skin contact: Get immediate medical advice/attention. Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse.

First-aid measures after eye contact: Get immediate medical advice/attention. Rinse immediately with plenty of water.

First-aid measures after ingestion: Immediately call a POISON CENTER or doctor/physician. Do NOT induce vomiting.

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


Symptoms/effects after inhalation: Cough.

Symptoms/effects after ingestion: Ingestion may cause nausea, vomiting and diarrhea.

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

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: Dry chemical powder, alcohol-resistant foam, carbon dioxide (CO2). Water spray.

5.2. Special hazards arising from the substance or mixture

Hazardous decomposition products in case of fire: Under fire conditions, hazardous fumes will be present.

5.3. Advice for firefighters

Precautionary measures fire: Do not enter fire area without proper protective equipment, including respiratory protection. Wear proper protective equipment.

Firefighting instructions: Prevent fire fighting water from entering the environment.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures: Spill should be handled by trained cleaning personnel properly equipped with respiratory and eye protection.

6.1.1. For non-emergency personnel

Measures in case of dust release: Use good housekeeping practices to avoid rendering dust airborne.

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Prevent entry to sewers and public waters.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up: Dispose in a safe manner in accordance with local/national regulations. Take up liquid spill into absorbent material.
6.4. **Reference to other sections**
No additional information available

### SECTION 7: Handling and storage

#### 7.1. **Precautions for safe handling**
Precautions for safe handling: Open only in well ventilated area.

#### 7.2. **Conditions for safe storage, including any incompatibilities**
Storage conditions: Store in dry, cool, well-ventilated area.
Storage temperature: 2 - 8 °C

#### 7.3. **Specific end use(s)**
For professional use only. Duchefa Biochemie B.V. products are intended only for "in vitro laboratory" research purposes.

### SECTION 8: Exposure controls/personal protection

#### 8.1. **Control parameters**
Additional information: Provide local exhaust or general room ventilation. Contaminated clothing can not be washed and should not be re-used for any purpose

#### 8.2. **Exposure controls**

**Hand protection:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Material</th>
<th>Permeation</th>
<th>Thickness (mm)</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloves</td>
<td>Nitrile rubber (NBR)</td>
<td>6 (&gt; 480 minutes)</td>
<td>0,11</td>
<td>EN 374</td>
</tr>
</tbody>
</table>

**Eye protection:**
Safety glasses

**Skin and body protection:**
Long sleeved protective clothing

**Respiratory protection:**
Wear appropriate mask. filter type P3 (EN 143)

### SECTION 9: Physical and chemical properties

#### 9.1. **Information on basic physical and chemical properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Appearance</td>
<td>Liquid</td>
</tr>
<tr>
<td>Molecular mass</td>
<td>527,5 g/mol</td>
</tr>
<tr>
<td>Colour</td>
<td>Dark brown</td>
</tr>
<tr>
<td>Odour</td>
<td>No data available</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>(butylacetate=1)</td>
<td></td>
</tr>
<tr>
<td>Melting point</td>
<td>No data available</td>
</tr>
<tr>
<td>Freezing point</td>
<td>No data available</td>
</tr>
<tr>
<td>Boiling point</td>
<td>≈ 100 °C</td>
</tr>
</tbody>
</table>
Hygromycin B
Safety Data Sheet
according to Regulation (EU) 2015/830

Flash point: No data available
Auto-ignition temperature: No data available
Decomposition temperature: No data available
Flammability (solid, gas): No data available
Vapour pressure: No data available
Relative vapour density at 20 °C: No data available
Relative density: No data available
Density: 1,147 g/l
Solubility: Soluble in water.
Log Pow: No data available
Viscosity, kinematic: No data available
Viscosity, dynamic: No data available
Explosive properties: No data available
Oxidising properties: No data available
Explosive limits: No data available

9.2. Other information
Other properties: Contains approximately 500 mg Hygromycin B/ml - 510 000 units/ml.

SECTION 10: Stability and reactivity

10.1. Reactivity
Stable under normal conditions of storage, handling and use.

10.2. Chemical stability
Stable under normal conditions of storage, handling and use.

10.3. Possibility of hazardous reactions
No additional information available

10.4. Conditions to avoid
No additional information available

10.5. Incompatible materials
Strong oxidizers.

10.6. Hazardous decomposition products
When heated to decomposition, emits dangerous fumes. COx. NOx.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

<table>
<thead>
<tr>
<th>Hygromycin B (31282-04-9)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LD50 oral</td>
<td>46000 (mouse, units/kg)</td>
</tr>
<tr>
<td>LC50 inhalation rat (mg/l)</td>
<td>2220 µg/m³ (4h)</td>
</tr>
<tr>
<td>ATE CLP (dermal)</td>
<td>5 mg/kg bodyweight</td>
</tr>
<tr>
<td>ATE CLP (vapours)</td>
<td>0,5 mg/l/4h</td>
</tr>
<tr>
<td>ATE CLP (dust,mist)</td>
<td>0,05 mg/l/4h</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td>Causes skin irritation.</td>
</tr>
</tbody>
</table>

22/09/2017 Duchefa Biochemie B.V. EN (English) SDS Ref.: H0192 5/9
Hygromycin B
Safety Data Sheet
according to Regulation (EU) 2015/830

Serious eye damage/irritation: Causes serious eye damage.
Respiratory or skin sensitisation: Not classified
Germ cell mutagenicity: Not classified
Carcinogenicity: Not classified

Reproductive toxicity: Not classified
STOT-single exposure: May cause respiratory irritation.
STOT-repeated exposure: Not classified
Aspiration hazard: Not classified
Other information: See actual entry in RTECS for complete information: WK2130000.

SECTION 12: Ecological information

12.1. Toxicity
No additional information available

12.2. Persistence and degradability
No additional information available

12.3. Bioaccumulative potential
No additional information available

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 in a safe manner in accordance with local/national regulations. Avoid release to the environment.

SECTION 14: Transport information

In accordance with ADR / IATA / IMDG

<table>
<thead>
<tr>
<th>ADR</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.1. UN number</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2810</td>
<td>2810</td>
<td>2810</td>
</tr>
<tr>
<td>14.2. UN proper shipping name</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOXIC LIQUID, ORGANIC, N.O.S.</td>
<td>TOXIC LIQUID, ORGANIC, N.O.S.</td>
<td>Toxic liquid, organic, n.o.s.</td>
</tr>
<tr>
<td>UN 2810 TOXIC LIQUID, ORGANIC, N.O.S., 6.1, II, (D/E)</td>
<td>UN 2810 TOXIC LIQUID, ORGANIC, N.O.S., 6.1, II</td>
<td>UN 2810 Toxic liquid, organic, n.o.s., 6.1, II</td>
</tr>
<tr>
<td>14.3. Transport hazard class(es)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.1</td>
<td>6.1</td>
<td>6.1</td>
</tr>
</tbody>
</table>
14.4. Packing group

<table>
<thead>
<tr>
<th>ADR</th>
<th>IMDG</th>
<th>IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>II</td>
<td>II</td>
<td>II</td>
</tr>
</tbody>
</table>

14.5. Environmental hazards

Dangerous for the environment : No  
Marine pollutant : No

Clean up even minor leaks or spills if possible without unnecessary risk

14.6. Special precautions for user

**Overland transport**

- Classification code (ADR) : T1
- Special provisions (ADR) : 274, 614
- Limited quantities (ADR) : 100ml
- Excepted quantities (ADR) : E4
- Transport category (ADR) : 2
- Special provisions for carriage - Operation (ADR) : S9, S19
- Hazard identification number (Kemler No.) : 60
- Orange plates : 60
- Tunnel restriction code (ADR) : D/E
- EAC code : 2X
- APP code : B

**- Transport by sea**

- Special provisions (IMDG) : 274
- Limited quantities (IMDG) : 100 ml
- Excepted quantities (IMDG) : E4
- EmS-No. (Fire) : F-A
- EmS-No. (Spillage) : S-A
- Stowage category (IMDG) : B
- Stowage and handling (IMDG) : SW2
- Properties and observations (IMDG) : Toxic if swallowed, by skin contact or by inhalation.
- MFAG-No : 153

**- Air transport**

- PCA Excepted quantities (IATA) : E4
- PCA Limited quantities (IATA) : Y641
- PCA limited quantity max net quantity (IATA) : 1L
- PCA packing instructions (IATA) : 654
- PCA max net quantity (IATA) : 5L
- CAO packing instructions (IATA) : 662
- CAO max net quantity (IATA) : 60L
- Special provisions (IATA) : A3, A4, A137
ERG code (IATA) : 6L

14.7. Transport in bulk according to Annex II of Marpol 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 substance on the REACH candidate list
Contains no REACH Annex XIV substances

15.1.2. National regulations
Ensure all national/local regulations are observed.

Germany
12th Ordinance Implementing the Federal Immission Control Act - 12.BImSchV : Is not subject of the 12. BImSchV (Hazardous Incident Ordinance)

Netherlands
SZW-lijst van kankerverwekkende stoffen : None of the components are listed
SZW-lijst van mutagene stoffen : None of the components are listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Borstvoeding : None of the components are listed
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid : None of the components are listed
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
Pregnant/breastfeeding women working with the product must not be in direct contact with the product

15.2. Chemical safety assessment
No additional information available

SECTION 16: Other information

Indication of changes:

<table>
<thead>
<tr>
<th></th>
<th>Emergency number</th>
<th>Modified</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Obsolete</td>
</tr>
<tr>
<td>8.2</td>
<td>Hand protection</td>
<td>Modified</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Specified material, thickness, etcetera of gloves</td>
</tr>
<tr>
<td>9.2</td>
<td>Other properties</td>
<td>Modified</td>
</tr>
</tbody>
</table>

Abbreviations and acronyms:
Hygromycin B
Safety Data Sheet

ATE       Acute Toxicity Estimate
ADR       European Agreement concerning the International Carriage of Dangerous Goods by Road
BCF       Bioconcentration factor
CLP       Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
DPD       Dangerous Preparations Directive 1999/45/EC
DSD       Dangerous Substances Directive 67/548/EEC
IATA      International Air Transport Association
IMDG      International Maritime Dangerous Goods
LC50      Median lethal concentration
LD50      Median lethal dose
LOAEL     Lowest Observed Adverse Effect Level
NOAEC     No-Observed Adverse Effect Concentration
PBT       Persistent Bioaccumulative Toxic
SDS       Safety Data Sheet


Full text of H- and EUH-statements:

<table>
<thead>
<tr>
<th>Acute Tox. 1 (Dermal)</th>
<th>Acute toxicity (dermal), Category 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Tox. 1 (Oral)</td>
<td>Acute toxicity (oral), Category 1</td>
</tr>
<tr>
<td>Acute Tox. 2 (Inhalation)</td>
<td>Acute toxicity (inhal.), Category 2</td>
</tr>
<tr>
<td>Eye Dam. 1</td>
<td>Serious eye damage/eye irritation, Category 1</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, Respiratory tract irritation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>H300</th>
<th>Fatal if swallowed.</th>
</tr>
</thead>
<tbody>
<tr>
<td>H310</td>
<td>Fatal in contact with skin.</td>
</tr>
<tr>
<td>H315</td>
<td>Causes skin irritation.</td>
</tr>
<tr>
<td>H318</td>
<td>Causes serious eye damage</td>
</tr>
<tr>
<td>H330</td>
<td>Fatal if inhaled.</td>
</tr>
<tr>
<td>H335</td>
<td>May cause respiratory irritation.</td>
</tr>
</tbody>
</table>

SDS Biochemicals version 2017

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.