1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

<table>
<thead>
<tr>
<th>Product name</th>
<th>Pertussis Toxin from Bordetella pertussis</th>
</tr>
</thead>
</table>
| Product number
Product number | 180                                      |
| Product name                  | Pertussis Toxin from Bordetella pertussis (Salt Free) |
| Product number
Product number | 181                                      |

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

Identified uses: Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company: List Biological Laboratories, Inc.
540 Division Street
Campbell, CA 95008-6906, USA

Telephone: (408) 866-6363
Fax: (408) 866-6364

1.4 Emergency telephone number

24 Hour Emergency Phone #: 1 (800) 255-3924 ChemTel Domestic
ChemTel Customer #: MIS2844833

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Acute toxicity, Oral (Category 2), H300
Acute toxicity, Inhalation (Category 2), H330
Acute toxicity, Dermal (Category 2), H310
Eye irritation (Category 2A), H319

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal Word: Danger
Hazard statement(s)
H300 + H310+ H330 Fatal if swallowed, if in contact with skin or if inhaled
H319 Causes serious eye irritation.

Precautionary statement(s)
P260 Do not breathe dust/fume/gas/vapors/spray.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use in a well-ventilated area.
P280 Wear protective gloves/ protective clothing/ eye protection.
P301 + P330 + P316 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician if you feel unwell. Rinse mouth.
P302 + P352 IF ON SKIN: Wash with plenty of soap and water
P304 + P340 + P316 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable to breathing. Get medical advice/attention.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do so. Continue rinsing.
P337 + P317 If eye irritation occurs: Get medical help.
P361 + P364 Take off immediately all contaminated clothing and wash before reuse
P304 + P316 Store in a well-ventilated place. Keep container tightly closed.

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS
Biohazard. Handle as if capable of transmitting infectious agents.

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Mixtures

Synonyms : PT, PTx, Islet Activating Protein, Pertussigen

Product #180

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS No.</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pertussis Toxin</td>
<td>70323-44-3</td>
<td>~3</td>
</tr>
<tr>
<td>Sodium Chloride (NaCl)</td>
<td>7647-14-5</td>
<td>~41</td>
</tr>
<tr>
<td>Sodium Phosphate, monobasic, monohydrate</td>
<td>10049-21-5</td>
<td>~19</td>
</tr>
<tr>
<td>Sodium Phosphate, dibasic, heptahydrate</td>
<td>7782-85-6</td>
<td>~37</td>
</tr>
</tbody>
</table>

Product #181

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS No.</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pertussis Toxin</td>
<td>70323-44-3</td>
<td>~100</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Move affected person out of dangerous area. Consult a physician. Show this safety data sheet to the doctor in attendance.

If inhaled
Remove victim to fresh air and keep at rest in a position comfortable to breathing. Get medical advice/attention.

In case of skin contact
Wash with plenty of soap and water. Consult a physician.

In case of eye contact
Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do so. Continue rinsing. Consult a physician.

If swallowed
Immediately call a POISON CENTER or doctor/physician if you feel unwell. Rinse mouth with water. Never give anything by mouth to an unconscious person.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labeling (see section 2.2) and/or in section 11.
4.3 Indication of any immediate medical attention and special treatment needed
No data available

5. FIREFIGHTING MEASURES

5.1 Extinguishing media
Suitable extinguishing media
Use extinguishing media appropriate to surrounding fire conditions.

5.2 Special hazards arising from the substance or mixture
Not flammable or combustible.

5.3 Protective equipment and precautions for fire-fighters
Use an approved/certified respirator.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Wear respiratory protection. Wear appropriate laboratory attire including lab coat, gloves and safety glasses. Nitrile gloves are recommended when handling lyophilized material. Avoid formation of dust and aerosols. Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust, vapors, mist or gas.

6.2 Environmental precautions
Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
In case of a spill or a release, take precautions to minimize worker exposure. For spills onto surface areas, the contaminated surface should be thoroughly sprayed or rinsed for at least five minutes with at least a 0.5% sodium hypochlorite solution, then wiped dry. Autoclaving may be applied to contaminated material which is in solution or to which the autoclave steam has access. Autoclaving at ≥121°C, ≥15 psi in a validated cycle will render the product safe.

Hold all material for appropriate disposal as described in Section 13 DISPOSAL CONSIDERATIONS.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Wear appropriate laboratory attire including lab coat, gloves and safety glasses. Nitrile gloves are recommended when handling lyophilized material. Avoid formation of dust and aerosols. Ensure adequate ventilation.

7.2 Conditions for safe storage, including any incompatibilities
Store at 2 – 8°C prior to and following reconstitution. DO NOT FREEZE. Keep container tightly closed in a dry and well-ventilated area.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters
Components with workplace control parameters
Contains no substances with occupational exposure limit values.

8.2 Exposure controls
Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

Personal protective equipment
Eyes
Wear safety goggles or glasses.
Skin
Handle with appropriate gloves. Wear nitrile gloves when handling the product in the lyophilized form. Wear appropriate laboratory clothing / lab coat.

Respiratory protection
Use respirators and components tested and approved under appropriate government standards; or, ensure adequate ventilation using engineering controls, such as a biological safety cabinet.

9. PHYSICAL AND CHEMICAL PROPERTIES
   a) Appearance Form: solid; Color: white
   b) Odor Data not available
   c) Odor threshold Data not available
   d) pH Data not available
   e) Melting point / freezing point Data not available
   f) Initial boiling point and boiling range Data not available
   g) Flash point Data not available
   h) Evaporation rate Data not available
   i) Flammability (solid, gas) Data not available
   j) Upper/Lower flammability or explosive limits Data not available
   k) Vapor pressure Data not available
   l) Vapor density Data not available
   m) Relative density Data not available
   n) Solubility(ies) Suspension
   o) Partition coefficient: n-octanol/water Data not available
   p) Auto-ignition temperature Data not available
   q) Decomposition temperature Data not available
   r) Viscosity Data not available

10. STABILITY AND REACTIVITY
    10.1 Reactivity
         No data available
    10.2 Chemical stability
         Stable under recommended storage conditions.
    10.3 Possibility of hazardous reactions
         No data available
    10.4 Conditions to avoid
         No data available
    10.5 Incompatible materials
         No data available
    10.6 Hazardous decomposition products
         No data available

11. TOXICOLOGY INFORMATION
    11.1 Information on toxicological effects
         To the best of our knowledge, the chemical, physical and toxicological properties have not been fully investigated.
         Acute toxicity
         No data available
         Inhalation: No data available
         Dermal: No data available
         Oral: No data available
Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
No data available

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity
No data available

Specific target organ toxicity – single exposure
No data available

Specific target organ toxicity – repeated exposure
No data available

Additional Information
Signs and Symptoms of Exposure
No data available

RTECS: XW5883750
LD$_{50}$ rat, 114 $\mu$g/kg iv; LD$_{50}$ mice, 127 $\mu$g/kg iv

Toxicity Data Reference:
Reported changes in insulin secretory response due to intravenous injection of 1 $\mu$g/kg in 5 volunteers.

Estimated lethal amount for a 100 lb (45.5 kg) human – without treatment or vaccinations – extrapolated from animal studies: 683 $\mu$g ip

12. ECOLOGICAL INFORMATION

12.1 Toxicity
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
No data available

12.6 Other adverse effects
No data available
13. DISPOSAL CONSIDERATIONS
   Dispose of waste in accordance with appropriate federal, state and local regulations or applicable governmental requirements.

14. TRANSPORT INFORMATION
   IATA
   UN number: UN3462          Class:  6.1          Packing group:  II
   Proper shipping name: Toxins, extracted from living sources, solid, n.o.s. (Pertussis from Bordetella Pertussis)

   DOT (US)
   UN number: UN3462          Class:  6.1          Packing group:  II
   Proper shipping name: Toxins, extracted from living sources, solid, n.o.s. (Pertussis from Bordetella Pertussis)

15. REGULATORY INFORMATION
   OSHA Hazards
   Danger

   SARA 302 Components
   No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.
   SARA 313 Components
   This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.
   SARA 311/312 Hazards
   Acute Health Hazard

   California Prop. 65 Components
   This product does not contain any chemicals known to the State of California to cause cancer, birth defects or any other reproductive harm.

16. OTHER INFORMATION
   Version: 4.0   /   Issued Date: 12/2019
   CAUTION – Not fully tested.  For research use only.  Not for human use.

   The preceding information is based on available data and is believed to be correct but does not purport to be all inclusive and should be used as a guide in handling this material.  Users should make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials, the safety and health of employees and customers, and the protection of the environment.  The absence of warning must not, under any circumstance, be taken to mean that no hazard exists.  List Biological Laboratories, Inc. shall not be held liable for any damage resulting from handling or from contact with the above product.