Section 1. Identification

Product identifier : ABLE K Competent Cells, Part Number 200172
Part no. (chemical kit) : 200172
Part no. : ABLE K competent cells 200172-41
             pUC 18 DNA Control Plasmid 200231-42
             Beta Mercaptoethanol 210200-43

Relevant identified uses of the substance or mixture and uses advised against
Material uses : Analytical reagent.
                For Research Use Only. Not for use in diagnostic procedures.
                ABLE K competent cells 1 ml (5 x 0.2 ml)
                pUC 18 DNA Control Plasmid 0.01 ml (0.1 ng/µl)
                Beta Mercaptoethanol 0.025 ml (25 µl 1.42M)

Supplier/Manufacturer : Agilent Technologies Australia Pty Ltd
                        679 Springvale Road
                        Mulgrave
                        Victoria 3170, Australia
                        1800 802 402

Emergency telephone number (with hours of operation) : CHEMTREC®: +(61)-290372994

Section 2. Hazard(s) identification

Classification of the substance or mixture

Beta Mercaptoethanol
H312 ACUTE TOXICITY (dermal) - Category 4
H315 SKIN CORROSION/IRRITATION - Category 2
H318 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1
H317 SKIN SENSITISATION - Category 1
H361 REPRODUCTIVE TOXICITY - Category 2
H373 SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 2
H412 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3

GHS label elements
Hazard pictograms : Beta Mercaptoethanol

Signal word
ABLE K competent cells No signal word.
pUC 18 DNA Control Plasmid No signal word.
Beta Mercaptoethanol DANGER

Hazard statements
ABLE K competent cells No known significant effects or critical hazards.
pUC 18 DNA Control Plasmid No known significant effects or critical hazards.
Beta Mercaptoethanol
H312 - Harmful in contact with skin.
H315 - Causes skin irritation.
H317 - May cause an allergic skin reaction.
H318 - Causes serious eye damage.
H361 - Suspected of damaging fertility or the unborn child.
H373 - May cause damage to organs through
Section 2. Hazard(s) identification

Precautionary statements

**Prevention**
- **ABLE K competent cells**: Not applicable.
- **pUC 18 DNA Control Plasmid**: Not applicable.
- **Beta Mercaptoethanol**: P281 - Use personal protective equipment as required.
  - P280 - Wear protective gloves and protective clothing.
  - Wear eye or face protection.
  - P260 - Do not breathe vapour.

**Response**
- **ABLE K competent cells**: Not applicable.
- **pUC 18 DNA Control Plasmid**: Not applicable.
- **Beta Mercaptoethanol**: P305 + P351 + P338, P310 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor.

**Storage**
- **ABLE K competent cells**: Not applicable.
- **pUC 18 DNA Control Plasmid**: Not applicable.
- **Beta Mercaptoethanol**: Not applicable.

**Disposal**
- **ABLE K competent cells**: Not applicable.
- **pUC 18 DNA Control Plasmid**: Not applicable.
- **Beta Mercaptoethanol**: P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Supplemental label elements**

**Additional warning phrases**
- **ABLE K competent cells**: Not applicable.
- **pUC 18 DNA Control Plasmid**: Not applicable.
- **Beta Mercaptoethanol**: Not applicable.

**Other hazards which do not result in classification**
- **ABLE K competent cells**: None known.
- **pUC 18 DNA Control Plasmid**: None known.
- **Beta Mercaptoethanol**: None known.

Section 3. Composition and ingredient information

**Substance/mixture**
- **ABLE K competent cells**: Mixture
- **pUC 18 DNA Control Plasmid**: Mixture
- **Beta Mercaptoethanol**: Mixture

**CAS number/other identifiers**

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>% (w/w)</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ABLE K competent cells</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycerol</td>
<td>≥10 - ≤30</td>
<td>56-81-5</td>
</tr>
<tr>
<td>Dimethyl sulfoxide</td>
<td>≤10</td>
<td>67-68-5</td>
</tr>
<tr>
<td>Sucrose</td>
<td>≤10</td>
<td>57-50-1</td>
</tr>
<tr>
<td><strong>Beta Mercaptoethanol</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-Mercaptoethanol</td>
<td>≤12</td>
<td>60-24-2</td>
</tr>
</tbody>
</table>

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.
Section 4. First aid measures

Description of necessary first aid measures

**Eye contact**
- **ABLE K competent cells**: 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.
- **pUC 18 DNA Control Plasmid**: 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.
- **Beta Mercaptoethanol**: 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.

**Inhalation**
- **ABLE K competent cells**: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
- **pUC 18 DNA Control Plasmid**: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
- **Beta Mercaptoethanol**: 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.

**Skin contact**
- **ABLE K competent cells**: Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
- **pUC 18 DNA Control Plasmid**: Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
- **Beta Mercaptoethanol**: Get medical attention immediately. Call a poison center or physician. Wash with plenty of soap and 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. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

**Ingestion**
- **ABLE K competent cells**: Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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.
- **pUC 18 DNA Control Plasmid**: Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the
## Section 4. First aid measures

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.

<table>
<thead>
<tr>
<th>Substance</th>
<th>First aid measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta Mercaptoethanol</td>
<td>Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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.</td>
</tr>
</tbody>
</table>

### Most important symptoms/effects, acute and delayed

#### Potential acute health effects

<table>
<thead>
<tr>
<th>Substance</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eye contact</strong></td>
<td>ABLE K competent cells: No known significant effects or critical hazards. pUC 18 DNA Control Plasmid: No known significant effects or critical hazards. Beta Mercaptoethanol: Causes serious eye damage.</td>
</tr>
<tr>
<td><strong>Inhalation</strong></td>
<td>ABLE K competent cells: No known significant effects or critical hazards. Beta Mercaptoethanol: Causes serious eye damage.</td>
</tr>
<tr>
<td><strong>Skin contact</strong></td>
<td>ABLE K competent cells: No known significant effects or critical hazards. pUC 18 DNA Control Plasmid: No known significant effects or critical hazards. Beta Mercaptoethanol: Harmful in contact with skin. Causes skin irritation. May cause an allergic skin reaction.</td>
</tr>
<tr>
<td><strong>Ingestion</strong></td>
<td>ABLE K competent cells: No known significant effects or critical hazards. pUC 18 DNA Control Plasmid: No known significant effects or critical hazards. Beta Mercaptoethanol: No known significant effects or critical hazards.</td>
</tr>
</tbody>
</table>

### Over-exposure signs/symptoms

<table>
<thead>
<tr>
<th>Substance</th>
<th>Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eye contact</strong></td>
<td>ABLE K competent cells: No specific data. pUC 18 DNA Control Plasmid: No specific data. Beta Mercaptoethanol: Adverse symptoms may include the following: pain, watering, redness</td>
</tr>
<tr>
<td><strong>Inhalation</strong></td>
<td>ABLE K competent cells: No specific data. pUC 18 DNA Control Plasmid: No specific data. Beta Mercaptoethanol: Adverse symptoms may include the following: reduced foetal weight, increase in foetal deaths, skeletal malformations</td>
</tr>
<tr>
<td><strong>Skin contact</strong></td>
<td>ABLE K competent cells: No specific data. pUC 18 DNA Control Plasmid: No specific data. Beta Mercaptoethanol: Adverse symptoms may include the following: pain or irritation, redness, blistering may occur, reduced foetal weight, increase in foetal deaths, skeletal malformations</td>
</tr>
</tbody>
</table>
## Section 4. First aid measures

### Ingestion

<table>
<thead>
<tr>
<th>Substance</th>
<th>Protection of first-aiders</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABLE K competent cells</td>
<td>No action shall be taken involving any personal risk or without suitable training.</td>
</tr>
<tr>
<td>pUC 18 DNA Control Plasmid</td>
<td>Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.</td>
</tr>
<tr>
<td>Beta Mercaptoethanol</td>
<td>Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.</td>
</tr>
</tbody>
</table>

### Indication of immediate medical attention and special treatment needed, if necessary

**Notes to physician**

<table>
<thead>
<tr>
<th>Substance</th>
<th>Indication of immediate medical attention and special treatment needed, if necessary</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABLE K competent cells</td>
<td>Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.</td>
</tr>
<tr>
<td>pUC 18 DNA Control Plasmid</td>
<td>Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.</td>
</tr>
<tr>
<td>Beta Mercaptoethanol</td>
<td>Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.</td>
</tr>
</tbody>
</table>

### Specific treatments

<table>
<thead>
<tr>
<th>Substance</th>
<th>Specific treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABLE K competent cells</td>
<td>No specific treatment.</td>
</tr>
<tr>
<td>pUC 18 DNA Control Plasmid</td>
<td>No specific treatment.</td>
</tr>
<tr>
<td>Beta Mercaptoethanol</td>
<td>No specific treatment.</td>
</tr>
</tbody>
</table>

### Protection of first-aiders

<table>
<thead>
<tr>
<th>Substance</th>
<th>Protection of first-aiders</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABLE K competent cells</td>
<td>No action shall be taken involving any personal risk or without suitable training.</td>
</tr>
<tr>
<td>pUC 18 DNA Control Plasmid</td>
<td>No action shall be taken involving any personal risk or without suitable training.</td>
</tr>
<tr>
<td>Beta Mercaptoethanol</td>
<td>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 dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.</td>
</tr>
</tbody>
</table>

### See toxicological information (Section 11)

## Section 5. Firefighting measures

### Extinguishing media

<table>
<thead>
<tr>
<th>Substance</th>
<th>Extinguishing media</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABLE K competent cells</td>
<td>Use an extinguishing agent suitable for the surrounding fire.</td>
</tr>
<tr>
<td>pUC 18 DNA Control Plasmid</td>
<td>Use an extinguishing agent suitable for the surrounding fire.</td>
</tr>
<tr>
<td>Beta Mercaptoethanol</td>
<td>Use an extinguishing agent suitable for the surrounding fire.</td>
</tr>
</tbody>
</table>

### Unsuitable extinguishing media

<table>
<thead>
<tr>
<th>Substance</th>
<th>Unsuitable extinguishing media</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABLE K competent cells</td>
<td>None known.</td>
</tr>
<tr>
<td>pUC 18 DNA Control Plasmid</td>
<td>None known.</td>
</tr>
<tr>
<td>Beta Mercaptoethanol</td>
<td>None known.</td>
</tr>
</tbody>
</table>

### Specific hazards arising from the chemical

<table>
<thead>
<tr>
<th>Substance</th>
<th>Specific hazards arising from the chemical</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABLE K competent cells</td>
<td>In a fire or if heated, a pressure increase will occur and the container may burst.</td>
</tr>
<tr>
<td>pUC 18 DNA Control Plasmid</td>
<td>In a fire or if heated, a pressure increase will occur and the container may burst.</td>
</tr>
<tr>
<td>Beta Mercaptoethanol</td>
<td>In a fire or if heated, a pressure increase will occur and the container may burst. The material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.</td>
</tr>
</tbody>
</table>
### Section 5. Firefighting measures

<table>
<thead>
<tr>
<th><strong>Hazardous thermal decomposition products</strong></th>
<th>ABLE K competent cells</th>
<th>Decomposition products may include the following materials: carbon dioxide, carbon monoxide, sulfur oxides, halogenated compounds, metal oxide/oxides</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>pUC 18 DNA Control Plasmid</td>
<td>No specific data.</td>
</tr>
<tr>
<td></td>
<td>Beta Mercaptoethanol</td>
<td>Decomposition products may include the following materials: carbon dioxide, carbon monoxide, sulfur oxides</td>
</tr>
</tbody>
</table>

**Special protective actions for fire-fighters**

<table>
<thead>
<tr>
<th>ABLE K competent cells</th>
<th>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.</th>
</tr>
</thead>
<tbody>
<tr>
<td>pUC 18 DNA Control Plasmid</td>
<td>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.</td>
</tr>
<tr>
<td>Beta Mercaptoethanol</td>
<td>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.</td>
</tr>
</tbody>
</table>

**Special protective equipment for fire-fighters**

<table>
<thead>
<tr>
<th>ABLE K competent cells</th>
<th>Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.</th>
</tr>
</thead>
<tbody>
<tr>
<td>pUC 18 DNA Control Plasmid</td>
<td>Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.</td>
</tr>
<tr>
<td>Beta Mercaptoethanol</td>
<td>Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.</td>
</tr>
</tbody>
</table>

### Section 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures**

**For non-emergency personnel**

<table>
<thead>
<tr>
<th>ABLE K competent cells</th>
<th>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. Put on appropriate personal protective equipment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>pUC 18 DNA Control Plasmid</td>
<td>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. Put on appropriate personal protective equipment.</td>
</tr>
<tr>
<td>Beta Mercaptoethanol</td>
<td>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. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.</td>
</tr>
</tbody>
</table>
Section 6. Accidental release measures

For emergency responders:

ABLE K competent cells: 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".

pUC 18 DNA Control Plasmid: 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".

Beta Mercaptoethanol: 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".

Environmental precautions:

ABLE K competent cells: 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).

pUC 18 DNA Control Plasmid: 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).

Beta Mercaptoethanol: Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

Methods and material for containment and cleaning up:

Methods for cleaning up:

ABLE K competent cells: 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.

pUC 18 DNA Control Plasmid: 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.

Beta Mercaptoethanol: 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.

Section 7. Handling and storage

Precautions for safe handling:

Protective measures:

ABLE K competent cells: Put on appropriate personal protective equipment (see Section 8).

pUC 18 DNA Control Plasmid: Put on appropriate personal protective equipment (see Section 8).

Beta Mercaptoethanol: Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Avoid exposure - obtain special instructions before use.
Section 7. Handling and storage

Advice on general occupational hygiene

**ABLE K competent cells**
Potentially biohazardous material. 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.

**pUC 18 DNA Control Plasmid**
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.

**Beta Mercaptoethanol**
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.

Conditions for safe storage, including any incompatibilities

**ABLE K competent cells**
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.

**pUC 18 DNA Control Plasmid**
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.

**Beta Mercaptoethanol**
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. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have
Section 7. Handling and storage

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.

Section 8. Exposure controls and personal protection

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>Exposure limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABLE K competent cells</td>
<td>Safe Work Australia (Australia, 12/2019).</td>
</tr>
<tr>
<td>Glycerol</td>
<td>TWA: 10 mg/m³ 8 hours.</td>
</tr>
<tr>
<td>Dimethyl sulfoxide</td>
<td>DFG MAC-values list (Germany, 7/2019).</td>
</tr>
<tr>
<td></td>
<td>Absorbed through skin.</td>
</tr>
<tr>
<td></td>
<td>PEAK: 320 mg/m³, 4 times per shift, 15 minutes.</td>
</tr>
<tr>
<td></td>
<td>TWA: 160 mg/m³ 8 hours.</td>
</tr>
<tr>
<td></td>
<td>PEAK: 100 ppm, 4 times per shift, 15 minutes.</td>
</tr>
<tr>
<td></td>
<td>TWA: 50 ppm 8 hours.</td>
</tr>
<tr>
<td>Sucrose</td>
<td>Safe Work Australia (Australia, 12/2019).</td>
</tr>
<tr>
<td></td>
<td>TWA: 10 mg/m³ 8 hours.</td>
</tr>
</tbody>
</table>

Appropriate engineering controls: If user operations generate dust, fumes, gas, vapour or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

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.

Individual protection measures

Hygiene measures: Handle as biohazard material (Biosafety level 1). 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. Contaminated work clothing should not be allowed out of the workplace. 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 and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

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.
Section 8. Exposure controls and personal protection

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.

Section 9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Physical state</th>
<th>pH</th>
<th>Melting point</th>
<th>Boiling point</th>
<th>Flash point</th>
<th>Evaporation rate</th>
<th>Flammability (solid, gas)</th>
<th>Lower and upper explosive (flammable) limits</th>
<th>Vapour pressure</th>
<th>Vapour density</th>
<th>Relative density</th>
</tr>
</thead>
</table>
### Section 9. Physical and chemical properties

**Solubility**
- **ABLE K competent cells**: Soluble in the following materials: cold water and hot water.
- **pUC 18 DNA Control Plasmid**: Easily soluble in the following materials: cold water and hot water.
- **Beta Mercaptoethanol**: Easily soluble in the following materials: cold water and hot water.

**Partition coefficient: n-octanol/water**
- **ABLE K competent cells**: Not available.
- **pUC 18 DNA Control Plasmid**: Not available.
- **Beta Mercaptoethanol**: Not available.

**Auto-ignition temperature**
- **ABLE K competent cells**: Not available.
- **pUC 18 DNA Control Plasmid**: Not available.
- **Beta Mercaptoethanol**: Not available.

**Viscosity**
- **ABLE K competent cells**: Not available.
- **pUC 18 DNA Control Plasmid**: Not available.
- **Beta Mercaptoethanol**: Not available.

### Section 10. Stability and reactivity

**Reactivity**
- **ABLE K competent cells**: No specific test data related to reactivity available for this product or its ingredients.
- **pUC 18 DNA Control Plasmid**: No specific test data related to reactivity available for this product or its ingredients.
- **Beta Mercaptoethanol**: No specific test data related to reactivity available for this product or its ingredients.

**Chemical stability**
- **ABLE K competent cells**: The product is stable.
- **pUC 18 DNA Control Plasmid**: The product is stable.
- **Beta Mercaptoethanol**: The product is stable.

**Possibility of hazardous reactions**
- **ABLE K competent cells**: Under normal conditions of storage and use, hazardous reactions will not occur.
- **pUC 18 DNA Control Plasmid**: Under normal conditions of storage and use, hazardous reactions will not occur.
- **Beta Mercaptoethanol**: Under normal conditions of storage and use, hazardous reactions will not occur.

**Conditions to avoid**
- **ABLE K competent cells**: No specific data.
- **pUC 18 DNA Control Plasmid**: No specific data.
- **Beta Mercaptoethanol**: No specific data.

**Incompatible materials**
- **ABLE K competent cells**: May react or be incompatible with oxidising materials.
- **pUC 18 DNA Control Plasmid**: May react or be incompatible with oxidising materials.
- **Beta Mercaptoethanol**: May react or be incompatible with oxidising materials.

**Hazardous decomposition products**
- **ABLE K competent cells**: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
- **pUC 18 DNA Control Plasmid**: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
- **Beta Mercaptoethanol**: Under normal conditions of storage and use, hazardous decomposition products should not be produced.
## Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glycerol</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>12600 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Dimethyl sulfoxide</td>
<td>LD50 Dermal</td>
<td>Rat</td>
<td>40000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Alpha Mercaptoethanol</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>14500 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Sucrose</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>29700 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Beta Mercaptoethanol</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>244 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

#### Irritation/Corrosion

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Score</th>
<th>Exposure</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glycerol</td>
<td>Eyes - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 500 mg</td>
<td>-</td>
</tr>
<tr>
<td>Dimethyl sulfoxide</td>
<td>Eyes - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 500 mg</td>
<td>-</td>
</tr>
<tr>
<td>Beta Mercaptoethanol</td>
<td>Eyes - Severe irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>2 mg</td>
<td>-</td>
</tr>
</tbody>
</table>

### Sensitisation

Not available.

### Mutagenicity

**Conclusion/Summary**: Not available.

---

### Specific target organ toxicity (single exposure)

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta Mercaptoethanol</td>
<td>Category 2</td>
<td>oral</td>
<td>heart, liver</td>
</tr>
</tbody>
</table>

### Specific target organ toxicity (repeated exposure)

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha Mercaptoethanol</td>
<td>Category 2</td>
<td>oral</td>
<td>heart, liver</td>
</tr>
</tbody>
</table>

### Aspiration hazard

Not available.

**Date of issue/Date of revision**: 18/11/2020

**Date of previous issue**: 24/05/2019

**Version**: 7
# Section 11. Toxicological information

## Information on likely routes of exposure

**Inhalation**
- **ABLE K competent cells**
  - Routes of entry anticipated: Oral, Dermal, Inhalation.
- **pUC 18 DNA Control Plasmid**
  - Routes of entry anticipated: Oral, Dermal, Inhalation.
- **Beta Mercaptoethanol**
  - Routes of entry anticipated: Oral, Dermal, Inhalation.

## Potential acute health effects

**Eye contact**
- **ABLE K competent cells**
  - No known significant effects or critical hazards.
- **pUC 18 DNA Control Plasmid**
  - No known significant effects or critical hazards.
- **Beta Mercaptoethanol**
  - Causes serious eye damage.

**Inhalation**
- **ABLE K competent cells**
  - No known significant effects or critical hazards.
- **pUC 18 DNA Control Plasmid**
  - No known significant effects or critical hazards.
- **Beta Mercaptoethanol**
  - No known significant effects or critical hazards.

**Skin contact**
- **ABLE K competent cells**
  - No known significant effects or critical hazards.
- **pUC 18 DNA Control Plasmid**
  - No known significant effects or critical hazards.
- **Beta Mercaptoethanol**
  - Harmful in contact with skin. Causes skin irritation. May cause an allergic skin reaction.

**Ingestion**
- **ABLE K competent cells**
  - No known significant effects or critical hazards.
- **pUC 18 DNA Control Plasmid**
  - No known significant effects or critical hazards.
- **Beta Mercaptoethanol**
  - No known significant effects or critical hazards.

## Symptoms related to the physical, chemical and toxicological characteristics

**Eye contact**
- **ABLE K competent cells**
  - No specific data.
- **pUC 18 DNA Control Plasmid**
  - No specific data.
- **Beta Mercaptoethanol**
  - Adverse symptoms may include the following:
    - pain
    - watering
    - redness

**Inhalation**
- **ABLE K competent cells**
  - No specific data.
- **pUC 18 DNA Control Plasmid**
  - No specific data.
- **Beta Mercaptoethanol**
  - Adverse symptoms may include the following:
    - reduced foetal weight
    - increase in foetal deaths
    - skeletal malformations

**Skin contact**
- **ABLE K competent cells**
  - No specific data.
- **pUC 18 DNA Control Plasmid**
  - No specific data.
- **Beta Mercaptoethanol**
  - Adverse symptoms may include the following:
    - pain or irritation
    - redness
    - blistering may occur
    - reduced foetal weight
    - increase in foetal deaths
    - skeletal malformations

**Ingestion**
- **ABLE K competent cells**
  - No specific data.
- **pUC 18 DNA Control Plasmid**
  - No specific data.
- **Beta Mercaptoethanol**
  - Adverse symptoms may include the following:
    - stomach pains
    - reduced foetal weight
    - increase in foetal deaths
    - skeletal malformations

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

### Short term exposure
- **Potential immediate effects**
  - Not available.
- **Potential delayed effects**
  - Not available.

### Long term exposure
- **Potential immediate effects**
  - Not available.
- **Potential delayed effects**
  - Not available.
- **Potential chronic health effects**
### Section 11. Toxicological information

**General**
- **ABLE K competent cells**
  - No known significant effects or critical hazards.
- **pUC 18 DNA Control Plasmid**
  - No known significant effects or critical hazards.
- **Beta Mercaptoethanol**
  - May cause damage to organs through prolonged or repeated exposure. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

**Carcinogenicity**
- **ABLE K competent cells**
  - No known significant effects or critical hazards.
- **pUC 18 DNA Control Plasmid**
  - No known significant effects or critical hazards.
- **Beta Mercaptoethanol**
  - No known significant effects or critical hazards.

**Mutagenicity**
- **ABLE K competent cells**
  - No known significant effects or critical hazards.
- **pUC 18 DNA Control Plasmid**
  - No known significant effects or critical hazards.
- **Beta Mercaptoethanol**
  - No known significant effects or critical hazards.

**Reproductive toxicity**
- **ABLE K competent cells**
  - No known significant effects or critical hazards.
- **pUC 18 DNA Control Plasmid**
  - No known significant effects or critical hazards.
- **Beta Mercaptoethanol**
  - Suspected of damaging fertility or the unborn child.

#### Numerical measures of toxicity

**Acute toxicity estimates**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Oral (mg/kg)</th>
<th>Dermal (mg/kg)</th>
<th>Inhalation (gases) (ppm)</th>
<th>Inhalation (vapours) (mg/l)</th>
<th>Inhalation (dusts and mists) (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ABLE K competent cells</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycerol</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimethyl sulfoxide</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sucrose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Beta Mercaptoethanol</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beta Mercaptoethanol</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-Mercaptoethanol</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Section 12. Ecological information**

**Toxicity**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ABLE K competent cells</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycerol</td>
<td>Acute LC50 54000 mg/l Fresh water</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
<tr>
<td>Dimethyl sulfoxide</td>
<td>Acute LC50 25000 ppm Fresh water</td>
<td>Daphnia - Daphnia magna - Neonate</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 34000000 μg/l Fresh water</td>
<td>Fish - Pimephales promelas</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 100 ul/L Marine water</td>
<td>Algae - Ulva lactuce</td>
<td>72 hours</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 100 ul/L Fresh water</td>
<td>Daphnia - Daphnia magna - Juvenile (Fledgling, Hatchling, Weanling)</td>
<td>21 days</td>
</tr>
</tbody>
</table>

**Persistence and degradability**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Test</th>
<th>Result</th>
<th>Dose</th>
<th>Inoculum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ABLE K competent cells</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycerol</td>
<td>301D Ready Biodegradability - Closed Bottle Test</td>
<td>93 % - 30 days</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Dimethyl sulfoxide</td>
<td>OECD 301D Ready Biodegradability -</td>
<td>31 % - Not readily - 28 days</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Section 12. Ecological information

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Aquatic half-life</th>
<th>Photolysis</th>
<th>Biodegradability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimethyl sulfoxide</td>
<td>-</td>
<td>-</td>
<td>Not readily</td>
</tr>
<tr>
<td>Beta Mercaptoethanol</td>
<td>-</td>
<td>-</td>
<td>Not readily</td>
</tr>
<tr>
<td>ABLE K competent cells</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Bioaccumulative potential

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>LogP&lt;sub&gt;ow&lt;/sub&gt;</th>
<th>BCF</th>
<th>Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABLE K competent cells</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycerol</td>
<td>-1.76</td>
<td>-</td>
<td>low</td>
</tr>
<tr>
<td>Dimethyl sulfoxide</td>
<td>-1.35</td>
<td>3.16</td>
<td>low</td>
</tr>
<tr>
<td>Sucrose</td>
<td>-3.7</td>
<td>-</td>
<td>low</td>
</tr>
<tr>
<td>Beta Mercaptoethanol</td>
<td>-0.056</td>
<td>-</td>
<td>low</td>
</tr>
<tr>
<td>2-Mercaptoethanol</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mobility in soil

Soil/water partition coefficient (K<sub>oc</sub>): Not available.

Other adverse effects: No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods: 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. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. 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 spill material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

ADG / IMDG / IATA: Not regulated as Dangerous Goods according to the ADG Code.

Special precautions for user: Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.
Section 14. Transport information

Transport in bulk according to IMO instruments

Not available.

Section 15. Regulatory information

Standard for the Uniform Scheduling of Medicines and Poisons

6

Model Work Health and Safety Regulations - Scheduled Substances

No listed substance

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

Australia : All components are listed or exempted.
Canada : All components are listed or exempted.
China : Not determined.
Europe : All components are listed or exempted.
Japan : Japan inventory (ENCS): Not determined.
Japan inventory (ISHL): All components are listed or exempted.
New Zealand : Not determined.
Philippines : Not determined.
Republic of Korea : All components are listed or exempted.
Taiwan : All components are listed or exempted.
Thailand : Not determined.
Turkey : Not determined.
United States : All components are active or exempted.
Viet Nam : Not determined.

Section 16. Any other relevant information

History

Date of issue/Date of revision : 18/11/2020
Date of previous issue : 24/05/2019
Version : 7

Key to abbreviations

ADG = Australian Dangerous Goods
ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
**Section 16. Any other relevant information**

IMDG = International Maritime Dangerous Goods  
LogPow = logarithm of the octanol/water partition coefficient  
N/A = Not available  
SUSMP = Standard Uniform Schedule of Medicine and Poisons  
UN = United Nations

**Procedure used to derive the classification**

<table>
<thead>
<tr>
<th>Classification</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta Mercaptoethanol</td>
<td>Calculation method</td>
</tr>
<tr>
<td>ACUTE TOXICITY (dermal) - Category 4</td>
<td>Calculation method</td>
</tr>
<tr>
<td>SKIN CORROSION/IRRITATION - Category 2</td>
<td>Calculation method</td>
</tr>
<tr>
<td>SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1</td>
<td>Calculation method</td>
</tr>
<tr>
<td>SKIN SENSITISATION - Category 1</td>
<td>Calculation method</td>
</tr>
<tr>
<td>REPRODUCTIVE TOXICITY - Category 2</td>
<td>Calculation method</td>
</tr>
<tr>
<td>SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 2</td>
<td>Calculation method</td>
</tr>
<tr>
<td>LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3</td>
<td>Calculation method</td>
</tr>
</tbody>
</table>

**References**  
Not available.

> Indicates information that has changed from previously issued version.

**Notice to reader**

Disclaimer: The information contained in this document is based on Agilent’s state of knowledge at the time of preparation. No warranty as to its accurateness, completeness or suitability for a particular purpose is expressed or implied.