Section 1. Identification

Product identifier: BL21-CodonPlus(DE3)-RP Competent Cells, Part Number 230255
Part No. (Chemical Kit): 230255
Part No.: BL21-CodonPlus(DE3)-RP competent cells 230255-41
pUC 18 DNA Control Plasmid 200231-42
XL10-Gold 2-Mercaptoethanol 200314-43

Relevant identified uses of the substance or mixture and uses advised against
Analytical reagent.
BL21-CodonPlus(DE3)-RP competent cells 1000 µl (10 x 100 µl)
pUC 18 DNA Control Plasmid 10 µl (0.1 ng/µl)
XL10-Gold 2-Mercaptoethanol 50 µl

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

<table>
<thead>
<tr>
<th>Substance</th>
<th>Hazard Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL21-CodonPlus(DE3)-RP</td>
<td>No signal word.</td>
</tr>
<tr>
<td>pUC 18 DNA Control Plasmid</td>
<td>No signal word.</td>
</tr>
<tr>
<td>XL10-Gold 2-Mercaptoethanol</td>
<td>DANGER</td>
</tr>
<tr>
<td></td>
<td>SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1</td>
</tr>
<tr>
<td></td>
<td>SKIN SENSITISATION - Category 1</td>
</tr>
<tr>
<td></td>
<td>LONG-TERM AQUATIC HAZARD - Category 3</td>
</tr>
</tbody>
</table>

GHS label elements

Hazard pictograms: 

- ![Hazard pictogram](image)

Signal word: BL21-CodonPlus(DE3)-RP

Hazard statements:

- No known significant effects or critical hazards.

Precautionary statements

- H318 - Causes serious eye damage.
- H317 - May cause an allergic skin reaction.
- H412 - Harmful to aquatic life with long lasting effects.

Date of issue/Date of revision: 17/10/2016
Date of previous issue: 31/08/2015
Version: 5
Section 2. Hazard(s) identification

**Prevention:**
- **BL21-CodonPlus(DE3)-RP competent cells**
- **pUC 18 DNA Control Plasmid**
- **XL10-Gold**
- **2-Mercaptoethanol**

**Response:**
- **BL21-CodonPlus(DE3)-RP competent cells**
- **pUC 18 DNA Control Plasmid**
- **XL10-Gold**
- **2-Mercaptoethanol**

**Storage:**
- **BL21-CodonPlus(DE3)-RP competent cells**
- **pUC 18 DNA Control Plasmid**
- **XL10-Gold**
- **2-Mercaptoethanol**

**Disposal:**
- **BL21-CodonPlus(DE3)-RP competent cells**
- **pUC 18 DNA Control Plasmid**
- **XL10-Gold**
- **2-Mercaptoethanol**

**Supplemental label elements:**
- **BL21-CodonPlus(DE3)-RP competent cells**
- **pUC 18 DNA Control Plasmid**
- **XL10-Gold**
- **2-Mercaptoethanol**

**Other hazards which do not result in classification:**
- **BL21-CodonPlus(DE3)-RP competent cells**
- **pUC 18 DNA Control Plasmid**
- **XL10-Gold**
- **2-Mercaptoethanol**

Section 3. Composition and ingredient information

**Substance/mixture:**
- **BL21-CodonPlus(DE3)-RP competent cells**
- **pUC 18 DNA Control Plasmid**
- **XL10-Gold**
- **2-Mercaptoethanol**

**CAS number/other identifiers**
Section 3. Composition and ingredient information

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>% (w/w)</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL21-CodonPlus(DE3)-RP competent cells</td>
<td>≥10 - ≤30</td>
<td>56-81-5</td>
</tr>
<tr>
<td>Glycerol</td>
<td>≤10</td>
<td>57-50-1</td>
</tr>
<tr>
<td>Sucrose</td>
<td>≤5</td>
<td>60-24-2</td>
</tr>
<tr>
<td>XL10-Gold 2-Mercaptoethanol</td>
<td>≤5</td>
<td>60-24-2</td>
</tr>
<tr>
<td>2-Mercaptoethanol</td>
<td></td>
<td></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**

- **BL21-CodonPlus(DE3)-RP 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.

- **XL10-Gold 2-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**

- **BL21-CodonPlus(DE3)-RP 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.

- **XL10-Gold 2-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**

- **BL21-CodonPlus(DE3)-RP 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.

- **XL10-Gold 2-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...
Section 4. First aid measures

Ingestion: BL21-CodonPlus(DE3)-RP 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.

Ingestion: 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 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.

Ingestion: XL10-Gold 2-Mercaptoethanol
- 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.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact: BL21-CodonPlus(DE3)-RP competent cells
- No known significant effects or critical hazards.

Inhalation: BL21-CodonPlus(DE3)-RP competent cells
- No known significant effects or critical hazards.

Skin contact: BL21-CodonPlus(DE3)-RP competent cells
- No known significant effects or critical hazards.

Ingestion: BL21-CodonPlus(DE3)-RP competent cells
- No known significant effects or critical hazards.
Section 4. First aid measures

**Eye contact**
- BL21-CodonPlus(DE3)-RP: No specific data.
- pUC 18 DNA Control Plasmid: No specific data.
- XL10-Gold: No specific data.
- 2-Mercaptoethanol: Adverse symptoms may include the following:
  - pain
  - watering
  - redness

**Inhalation**
- BL21-CodonPlus(DE3)-RP: No specific data.
- pUC 18 DNA Control Plasmid: No specific data.
- XL10-Gold: No specific data.
- 2-Mercaptoethanol: No specific data.

**Skin contact**
- BL21-CodonPlus(DE3)-RP: No specific data.
- pUC 18 DNA Control Plasmid: No specific data.
- XL10-Gold: No specific data.
- 2-Mercaptoethanol: Adverse symptoms may include the following:
  - pain or irritation
  - redness
  - blistering may occur

**Ingestion**
- BL21-CodonPlus(DE3)-RP: No specific data.
- pUC 18 DNA Control Plasmid: No specific data.
- XL10-Gold: No specific data.
- 2-Mercaptoethanol: Adverse symptoms may include the following:
  - stomach pains

**Indication of immediate medical attention and special treatment needed, if necessary**
- Notes to physician:
  - BL21-CodonPlus(DE3)-RP: Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
  - pUC 18 DNA Control Plasmid: Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
  - XL10-Gold: Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
  - 2-Mercaptoethanol: Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

**Specific treatments**
- pUC 18 DNA Control Plasmid: No specific treatment.
- XL10-Gold: No specific treatment.

**Protection of first-aiders**
- BL21-CodonPlus(DE3)-RP: No action shall be taken involving any personal risk or without suitable training.
- pUC 18 DNA Control Plasmid: No action shall be taken involving any personal risk or without suitable training.
- XL10-Gold: No action shall be taken involving any personal risk or without suitable training.
- 2-Mercaptoethanol: 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.

See toxicological information (Section 11)
Section 5. Firefighting measures

**Extinguishing media**

<table>
<thead>
<tr>
<th>Suitable extinguishing media</th>
<th>BL21-CodonPlus(DE3)-RP competent cells</th>
<th>Use an extinguishing agent suitable for the surrounding fire.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>pUC 18 DNA Control Plasmid</td>
<td>Use an extinguishing agent suitable for the surrounding fire.</td>
</tr>
<tr>
<td></td>
<td>XL10-Gold</td>
<td>Use an extinguishing agent suitable for the surrounding fire.</td>
</tr>
<tr>
<td></td>
<td>2-Mercaptoethanol</td>
<td>Use an extinguishing agent suitable for the surrounding fire.</td>
</tr>
<tr>
<td>Unsuitable extinguishing media</td>
<td>BL21-CodonPlus(DE3)-RP competent cells</td>
<td>None known.</td>
</tr>
<tr>
<td></td>
<td>pUC 18 DNA Control Plasmid</td>
<td>None known.</td>
</tr>
<tr>
<td></td>
<td>XL10-Gold</td>
<td>None known.</td>
</tr>
<tr>
<td></td>
<td>2-Mercaptoethanol</td>
<td>None known.</td>
</tr>
</tbody>
</table>

**Specific hazards arising from the chemical**

<table>
<thead>
<tr>
<th>BL21-CodonPlus(DE3)-RP competent cells</th>
<th>In a fire or if heated, a pressure increase will occur and the container may burst.</th>
</tr>
</thead>
<tbody>
<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>XL10-Gold</td>
<td>In a fire or if heated, a pressure increase will occur and the container may burst. This 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>
<tr>
<td>2-Mercaptoethanol</td>
<td>No specific data.</td>
</tr>
</tbody>
</table>

**Hazardous thermal decomposition products**

<table>
<thead>
<tr>
<th>BL21-CodonPlus(DE3)-RP competent cells</th>
<th>Decomposition products may include the following materials:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>carbon dioxide</td>
</tr>
<tr>
<td></td>
<td>carbon monoxide</td>
</tr>
<tr>
<td></td>
<td>sulfur oxides</td>
</tr>
<tr>
<td></td>
<td>halogenated compounds</td>
</tr>
<tr>
<td></td>
<td>metal oxide/oxides</td>
</tr>
<tr>
<td>pUC 18 DNA Control Plasmid</td>
<td>No specific data.</td>
</tr>
<tr>
<td>XL10-Gold</td>
<td>Decomposition products may include the following materials:</td>
</tr>
<tr>
<td>2-Mercaptoethanol</td>
<td>carbon dioxide</td>
</tr>
<tr>
<td></td>
<td>carbon monoxide</td>
</tr>
<tr>
<td></td>
<td>sulfur oxides</td>
</tr>
<tr>
<td></td>
<td>halogenated compounds</td>
</tr>
<tr>
<td></td>
<td>metal oxide/oxides</td>
</tr>
</tbody>
</table>

**Special protective actions for fire-fighters**

<table>
<thead>
<tr>
<th>BL21-CodonPlus(DE3)-RP 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>XL10-Gold</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>BL21-CodonPlus(DE3)-RP 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>XL10-Gold</td>
<td>Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus</td>
</tr>
</tbody>
</table>
Section 5. Firefighting measures

(SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Environmental precautions

For non-emergency personnel: BL21-CodonPlus(DE3)-RP 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).

For emergency responders: BL21-CodonPlus(DE3)-RP 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
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).

XL10-Gold 2-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
Section 6. Accidental release measures

Methods for cleaning up

<table>
<thead>
<tr>
<th>Product</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL21-CodonPlus(DE3)-RP competent cells</td>
<td>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.</td>
</tr>
<tr>
<td>pUC 18 DNA Control Plasmid</td>
<td>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.</td>
</tr>
<tr>
<td>XL10-Gold 2-Mercaptoethanol</td>
<td>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.</td>
</tr>
</tbody>
</table>

Section 7. Handling and storage

Precautions for safe handling

<table>
<thead>
<tr>
<th>Product</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL21-CodonPlus(DE3)-RP competent cells</td>
<td>Put on appropriate personal protective equipment (see Section 8).</td>
</tr>
<tr>
<td>pUC 18 DNA Control Plasmid</td>
<td>Put on appropriate personal protective equipment (see Section 8).</td>
</tr>
<tr>
<td>XL10-Gold 2-Mercaptoethanol</td>
<td>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. Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.</td>
</tr>
</tbody>
</table>

Advice on general occupational hygiene

<table>
<thead>
<tr>
<th>Product</th>
<th>Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL21-CodonPlus(DE3)-RP competent cells</td>
<td>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.</td>
</tr>
<tr>
<td>pUC 18 DNA Control Plasmid</td>
<td>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.</td>
</tr>
<tr>
<td>XL10-Gold 2-Mercaptoethanol</td>
<td>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.</td>
</tr>
</tbody>
</table>
Section 7. Handling and storage

Conditions for safe storage, including any incompatibilities:

- **BL21-CodonPlus(DE3)-RP 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.

- **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.

- **XL10-Gold 2-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 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.

Section 8. Exposure controls and personal protection

**Control parameters**

**Occupational exposure limits**

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>Exposure limits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BL21-CodonPlus(DE3)-RP competent cells</strong></td>
<td></td>
</tr>
<tr>
<td>Glycerol</td>
<td></td>
</tr>
<tr>
<td>Sucrose</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Safe Work Australia (Australia, 1/2014).</strong></td>
</tr>
<tr>
<td></td>
<td>TWA: 10 mg/m³ 8 hours.</td>
</tr>
<tr>
<td></td>
<td><strong>Safe Work Australia (Australia, 1/2014).</strong></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.
Section 8. Exposure controls and personal protection

**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.

**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

**Appearance**

**Physical state**
BL21-CodonPlus(DE3)-RP competent cells Liquid.
pUC 18 DNA Control Plasmid Liquid.
XL10-Gold Liquid.
2-Mercaptoethanol Liquid.

**Colour**
BL21-CodonPlus(DE3)-RP competent cells Not available.
pUC 18 DNA Control Plasmid Not available.
XL10-Gold Not available.
2-Mercaptoethanol Not available.

**Odour**
BL21-CodonPlus(DE3)-RP competent cells Not available.
pUC 18 DNA Control Plasmid Not available.
XL10-Gold Not available.
2-Mercaptoethanol Not available.

**Odour threshold**
BL21-CodonPlus(DE3)-RP competent cells Not available.
pUC 18 DNA Control Plasmid Not available.
XL10-Gold Not available.
2-Mercaptoethanol Not available.

**pH**
BL21-CodonPlus(DE3)-RP competent cells 6.4
pUC 18 DNA Control Plasmid 7.5
XL10-Gold Not available.
2-Mercaptoethanol Not available.

**Melting point**
BL21-CodonPlus(DE3)-RP competent cells Not available.
pUC 18 DNA Control Plasmid 0°C (32°F)
XL10-Gold Not available.
2-Mercaptoethanol Not available.
## Section 9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>BL21-CodonPlus(DE3)-RP competent cells</th>
<th>Not available.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling point</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flash point</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaporation rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td></td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Lower and upper explosive (flammable) limits</td>
<td></td>
<td>Not available.</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vapour density</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relative density</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solubility</td>
<td></td>
<td>Soluble in the following materials: cold water and hot water.</td>
</tr>
<tr>
<td>Partition coefficient: n-octanol/water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td></td>
<td>Not available.</td>
</tr>
</tbody>
</table>
## Section 9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>BL21-CodonPlus(DE3)-RP competent cells</th>
<th>pUC 18 DNA Control Plasmid</th>
<th>XL10-Gold</th>
<th>2-Mercaptoethanol</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Viscosity</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

## Section 10. Stability and reactivity

<table>
<thead>
<tr>
<th>Property</th>
<th>BL21-CodonPlus(DE3)-RP competent cells</th>
<th>pUC 18 DNA Control Plasmid</th>
<th>XL10-Gold</th>
<th>2-Mercaptoethanol</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reactivity</strong></td>
<td>No specific test data related to reactivity available for this product or its ingredients.</td>
<td>No specific test data related to reactivity available for this product or its ingredients.</td>
<td>No specific test data related to reactivity available for this product or its ingredients.</td>
<td></td>
</tr>
<tr>
<td><strong>Chemical stability</strong></td>
<td>The product is stable.</td>
<td>The product is stable.</td>
<td>The product is stable.</td>
<td></td>
</tr>
<tr>
<td><strong>Possibility of hazardous reactions</strong></td>
<td>Under normal conditions of storage and use, hazardous reactions will not occur.</td>
<td>Under normal conditions of storage and use, hazardous reactions will not occur.</td>
<td>Under normal conditions of storage and use, hazardous reactions will not occur.</td>
<td></td>
</tr>
<tr>
<td><strong>Conditions to avoid</strong></td>
<td>No specific data.</td>
<td>No specific data.</td>
<td>No specific data.</td>
<td></td>
</tr>
<tr>
<td><strong>Incompatible materials</strong></td>
<td>May react or be incompatible with oxidising materials.</td>
<td>May react or be incompatible with oxidising materials.</td>
<td>May react or be incompatible with oxidising materials.</td>
<td></td>
</tr>
<tr>
<td><strong>Hazardous decomposition products</strong></td>
<td>Under normal conditions of storage and use, hazardous decomposition products should not be produced.</td>
<td>Under normal conditions of storage and use, hazardous decomposition products should not be produced.</td>
<td>Under normal conditions of storage and use, hazardous decomposition products should not be produced.</td>
<td></td>
</tr>
</tbody>
</table>
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>BL21-CodonPlus(DE3)-RP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>competent cells</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycerol</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>12600 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>29700 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Sucrose</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>XL10-Gold</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-Mercaptoethanol</td>
<td>LD50 Dermal</td>
<td>Rabbit</td>
<td>200 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td></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>BL21-CodonPlus(DE3)-RP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>competent cells</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycerol</td>
<td>Eyes - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 500</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Skin - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 500</td>
<td>-</td>
</tr>
<tr>
<td>XL10-Gold</td>
<td>Eyes - Severe irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>2 milligrams</td>
<td>-</td>
</tr>
<tr>
<td>2-Mercaptoethanol</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sensitisation

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Reproductive toxicity

Not available.

Teratogenicity

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>XL10-Gold 2-Mercaptoethanol</td>
<td>Category 3</td>
<td>Not applicable.</td>
<td>Respiratory tract irritation</td>
</tr>
</tbody>
</table>

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on likely routes of exposure: BL21-CodonPlus(DE3)-RP competent cells Routes of entry anticipated: Oral, Dermal, Inhalation.
pUC 18 DNA Control Plasmid Not available.
XL10-Gold 2-Mercaptoethanol Routes of entry anticipated: Oral, Dermal, Inhalation.
# Section 11. Toxicological information

## Potential acute health effects

<table>
<thead>
<tr>
<th>Exposure</th>
<th>BL21-CodonPlus(DE3)-RP competent cells</th>
<th>pUC 18 DNA Control Plasmid</th>
<th>XL10-Gold</th>
<th>2-Mercaptoethanol</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eye contact</strong></td>
<td>No known significant effects or critical hazards.</td>
<td>No known significant effects or critical hazards.</td>
<td>Causes serious eye damage.</td>
<td></td>
</tr>
<tr>
<td><strong>Inhalation</strong></td>
<td>No known significant effects or critical hazards.</td>
<td>No known significant effects or critical hazards.</td>
<td>No known significant effects or critical hazards.</td>
<td></td>
</tr>
<tr>
<td><strong>Skin contact</strong></td>
<td>No known significant effects or critical hazards.</td>
<td>No known significant effects or critical hazards.</td>
<td>May cause an allergic skin reaction.</td>
<td></td>
</tr>
<tr>
<td><strong>Ingestion</strong></td>
<td>No known significant effects or critical hazards.</td>
<td>No known significant effects or critical hazards.</td>
<td>No known significant effects or critical hazards.</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Exposure</th>
<th>BL21-CodonPlus(DE3)-RP competent cells</th>
<th>pUC 18 DNA Control Plasmid</th>
<th>XL10-Gold</th>
<th>2-Mercaptoethanol</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eye contact</strong></td>
<td>No specific data.</td>
<td>No specific data.</td>
<td>Adverse symptoms may include the following:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>pain</td>
<td>watering</td>
<td>redness</td>
<td></td>
</tr>
<tr>
<td><strong>Inhalation</strong></td>
<td>No specific data.</td>
<td>No specific data.</td>
<td>No specific data.</td>
<td></td>
</tr>
<tr>
<td><strong>Skin contact</strong></td>
<td>No specific data.</td>
<td>No specific data.</td>
<td>Adverse symptoms may include the following:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>pain or irritation</td>
<td>redness</td>
<td>blistering may occur</td>
<td></td>
</tr>
<tr>
<td><strong>Ingestion</strong></td>
<td>No specific data.</td>
<td>No specific data.</td>
<td>Adverse symptoms may include the following:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>stomach pains</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## 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. |
Section 11. Toxicological information

Potential delayed effects : Not available.
Potential chronic health effects
Not available.

General : BL21-CodonPlus(DE3)-RP competent cells
          pUC 18 DNA Control Plasmid
          XL10-Gold
          2-Mercaptoethanol
          No known significant effects or critical hazards.

Carcinogenicity : BL21-CodonPlus(DE3)-RP competent cells
          pUC 18 DNA Control Plasmid
          XL10-Gold
          2-Mercaptoethanol
          No known significant effects or critical hazards.

Mutagenicity : BL21-CodonPlus(DE3)-RP competent cells
          pUC 18 DNA Control Plasmid
          XL10-Gold
          2-Mercaptoethanol
          No known significant effects or critical hazards.

Teratogenicity : BL21-CodonPlus(DE3)-RP competent cells
          pUC 18 DNA Control Plasmid
          XL10-Gold
          2-Mercaptoethanol
          No known significant effects or critical hazards.

Developmental effects : BL21-CodonPlus(DE3)-RP competent cells
          pUC 18 DNA Control Plasmid
          XL10-Gold
          2-Mercaptoethanol
          No known significant effects or critical hazards.

Fertility effects : BL21-CodonPlus(DE3)-RP competent cells
          pUC 18 DNA Control Plasmid
          XL10-Gold
          2-Mercaptoethanol
          No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>5545.5 mg/kg</td>
</tr>
<tr>
<td>Dermal</td>
<td>4545.5 mg/kg</td>
</tr>
<tr>
<td>Inhalation (vapours)</td>
<td>45.45 mg/l</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>BL21-CodonPlus(DE3)-RP</td>
<td>Acute LC50 54000 mg/l</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
<tr>
<td>competet cells</td>
<td>Fresh water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycerol</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Persistence and degradability
Not available.

Bioaccumulative potential

Date of issue/Date of revision : 17/10/2016 Date of previous issue : 31/08/2015
Version : 5
Section 12. Ecological information

<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>BL21-CodonPlus(DE3)-RP 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>Sucrose</td>
<td>-3.7</td>
<td>-</td>
<td>low</td>
</tr>
<tr>
<td>XL10-Gold 2-Mercaptoethanol</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-Mercaptoethanol</td>
<td>-0.056</td>
<td>-</td>
<td>low</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

Regulatory 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.

Transport in bulk according to Annex II of Marpol and the IBC Code: Not available.

Section 15. Regulatory information

Standard Uniform Schedule of Medicine and Poisons

6

Model Work Health and Safety Regulations - Scheduled Substances

No listed substance

Australia inventory (AICS): All components are listed or exempted.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol (Annexes A, B, C, E)

Not listed.

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Section 15. Regulatory information

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.

International lists

National inventory
Canada : All components are listed or exempted.
China : Not determined.
Europe : All components are listed or exempted.
Malaysia : Not determined.
New Zealand : Not determined.
Philippines : Not determined.
Republic of Korea : All components are listed or exempted.
Taiwan : All components are listed or exempted.
Turkey : Not determined.
United States : All components are listed or exempted.

Section 16. Any other relevant information

History
Date of issue/Date of revision : 17/10/2016
Date of previous issue : 31/08/2015.
Version : 5

Key to abbreviations
ADG = Australian Dangerous Goods
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
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
NOHSC = National Occupational Health and Safety Commission
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>XL10-Gold 2-Mercaptoethanol</td>
<td>Calculation method</td>
</tr>
<tr>
<td>Eye Dam. 1, H318</td>
<td>Calculation method</td>
</tr>
<tr>
<td>Skin Sens. 1, H317</td>
<td>Calculation method</td>
</tr>
<tr>
<td>Aquatic Chronic 3, H412</td>
<td>Calculation method</td>
</tr>
</tbody>
</table>

References : Not available.

Notice to reader

Indicates information that has changed from previously issued version.
Section 16. Any other relevant information

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