Section 1. Identification

Product identifier : BL21-CodonPlus-RIL Competent Cells, Part Number 230240
Part No. (Chemical Kit) : 230240
Part No. : BL21-CodonPlus-RIL competent cells 230240-41
           pUC 18 DNA Control Plasmid 200231-42
           XL10-Gold 2-Mercaptoethanol 200314-43

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

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

Analytical reagent.

BL21-CodonPlus-RIL 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

Section 2. Hazard(s) identification

Classification of the substance or mixture

XL10-Gold
2-Mercaptoethanol
H318  SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1
H317  SKIN SENSITISATION - Category 1
H412  LONG-TERM AQUATIC HAZARD - Category 3

GHS label elements

Hazard pictograms : 

Signal word : BL21-CodonPlus-RIL No signal word.
              competent cells
              pUC 18 DNA Control Plasmid No signal word.
              XL10-Gold DANGER
              2-Mercaptoethanol

Hazard statements : BL21-CodonPlus-RIL No known significant effects or critical hazards.
                    competent cells
                    pUC 18 DNA Control Plasmid No known significant effects or critical hazards.
                    XL10-Gold H318 - Causes serious eye damage.
                    2-Mercaptoethanol
                    H317 - May cause an allergic skin reaction.
                    H412 - Harmful to aquatic life with long lasting effects.

Precautionary statements

Date of issue/Date of revision : 14/10/2016
Date of previous issue : 31/08/2015
Version : 5
Section 2. Hazard(s) identification

**Prevention**

- **BL21-CodonPlus-RIL competent cells**: Not applicable.
- **pUC 18 DNA Control Plasmid**: Not applicable.
- **XL10-Gold**: P280 - Wear protective gloves. Wear eye or face protection.
- **2-Mercaptoethanol**: P273 - Avoid release to the environment. P261 - Avoid breathing vapour. P272 - Contaminated work clothing should not be allowed out of the workplace.

**Response**

- **BL21-CodonPlus-RIL competent cells**: Not applicable.
- **pUC 18 DNA Control Plasmid**: Not applicable.
- **XL10-Gold**: P302 + P352 + P363 - IF ON SKIN: Wash with plenty of soap and water. Wash contaminated clothing before reuse. P333 + P313 - If skin irritation or rash occurs: Get medical attention. 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 physician.

**Storage**

- **BL21-CodonPlus-RIL competent cells**: Not applicable.
- **pUC 18 DNA Control Plasmid**: Not applicable.
- **XL10-Gold**: Not applicable.

**Disposal**

- **BL21-CodonPlus-RIL competent cells**: Not applicable.
- **pUC 18 DNA Control Plasmid**: Not applicable.
- **XL10-Gold**: P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

**Supplemental label elements**

- **BL21-CodonPlus-RIL competent cells**: Not applicable.
- **pUC 18 DNA Control Plasmid**: Not applicable.
- **XL10-Gold**: Not applicable.
- **2-Mercaptoethanol**: Not applicable.

**Other hazards which do not result in classification**

- **BL21-CodonPlus-RIL competent cells**: None known.
- **pUC 18 DNA Control Plasmid**: None known.
- **XL10-Gold**: None known.
- **2-Mercaptoethanol**: None known.

Section 3. Composition and ingredient information

**Substance/mixture**

- **BL21-CodonPlus-RIL competent cells**: Mixture
- **pUC 18 DNA Control Plasmid**: Mixture
- **XL10-Gold**: Mixture
- **2-Mercaptoethanol**: Mixture

**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-RIL 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></td>
<td></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

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>Description of necessary first aid measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL21-CodonPlus-RIL competent cells</td>
<td>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.</td>
</tr>
<tr>
<td>pUC 18 DNA Control Plasmid</td>
<td>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.</td>
</tr>
<tr>
<td>XL10-Gold 2-Mercaptoethanol</td>
<td>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.</td>
</tr>
</tbody>
</table>

#### Inhalation

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>Description of necessary first aid measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL21-CodonPlus-RIL competent cells</td>
<td>Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.</td>
</tr>
<tr>
<td>pUC 18 DNA Control Plasmid</td>
<td>Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.</td>
</tr>
<tr>
<td>XL10-Gold 2-Mercaptoethanol</td>
<td>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 wristband.</td>
</tr>
</tbody>
</table>

#### Skin contact

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>Description of necessary first aid measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL21-CodonPlus-RIL competent cells</td>
<td>Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.</td>
</tr>
<tr>
<td>pUC 18 DNA Control Plasmid</td>
<td>Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.</td>
</tr>
<tr>
<td>XL10-Gold 2-Mercaptoethanol</td>
<td>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</td>
</tr>
</tbody>
</table>
Section 4. First aid measures

Ingestion:
- **BL21-CodonPlus-RIL 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 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.
- **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-RIL competent cells**: No known significant effects or critical hazards.
- **pUC 18 DNA Control Plasmid**: No known significant effects or critical hazards.
- **XL10-Gold 2-Mercaptoethanol**: Causes serious eye damage.

**Inhalation**:
- **BL21-CodonPlus-RIL competent cells**: No known significant effects or critical hazards.
- **pUC 18 DNA Control Plasmid**: No known significant effects or critical hazards.
- **XL10-Gold 2-Mercaptoethanol**: No known significant effects or critical hazards.

**Skin contact**:
- **BL21-CodonPlus-RIL competent cells**: No known significant effects or critical hazards.
- **pUC 18 DNA Control Plasmid**: No known significant effects or critical hazards.
- **XL10-Gold 2-Mercaptoethanol**: May cause an allergic skin reaction.

**Ingestion**:
- **BL21-CodonPlus-RIL competent cells**: No known significant effects or critical hazards.
- **pUC 18 DNA Control Plasmid**: No known significant effects or critical hazards.
- **XL10-Gold 2-Mercaptoethanol**: No known significant effects or critical hazards.

Over-exposure signs/symptoms

Date of issue/Date of revision: 14/10/2016  Date of previous issue: 31/08/2015  Version: 5  4/18
## Section 4. First aid measures

<table>
<thead>
<tr>
<th>Condition</th>
<th>BL21-CodonPlus-RIL 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></td>
<td></td>
</tr>
<tr>
<td><strong>Inhalation</strong></td>
<td>No specific data.</td>
<td>No specific data.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Skin contact</strong></td>
<td>No specific data.</td>
<td>No specific data.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ingestion</strong></td>
<td>No specific data.</td>
<td>No specific data.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Adverse symptoms

- **Eye contact**
  - BL21-CodonPlus-RIL competent cells
  - pUC 18 DNA Control Plasmid
  - XL10-Gold
  - 2-Mercaptoethanol
  - No specific data.

- **Inhalation**
  - BL21-CodonPlus-RIL competent cells
  - pUC 18 DNA Control Plasmid
  - XL10-Gold
  - 2-Mercaptoethanol
  - No specific data.

- **Skin contact**
  - BL21-CodonPlus-RIL competent cells
  - pUC 18 DNA Control Plasmid
  - XL10-Gold
  - 2-Mercaptoethanol
  - No specific data.

- **Ingestion**
  - BL21-CodonPlus-RIL competent cells
  - pUC 18 DNA Control Plasmid
  - XL10-Gold
  - 2-Mercaptoethanol
  - No specific data.

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

**Notes to physician**

- BL21-CodonPlus-RIL competent cells
  - 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.

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

**Extinguishing media**

**Suitable extinguishing media**
- BL21-CodonPlus-RIL competent cells
- pUC 18 DNA Control Plasmid
- XL10-Gold
- 2-Mercaptoethanol

**Unsuitable extinguishing media**
- BL21-CodonPlus-RIL competent cells
- pUC 18 DNA Control Plasmid
- XL10-Gold
- 2-Mercaptoethanol

**Specific hazards arising from the chemical**
- BL21-CodonPlus-RIL competent cells
- pUC 18 DNA Control Plasmid
- XL10-Gold
- 2-Mercaptoethanol

**Hazardous thermal decomposition products**
- BL21-CodonPlus-RIL competent cells
- pUC 18 DNA Control Plasmid
- XL10-Gold
- 2-Mercaptoethanol

**Special protective actions for fire-fighters**
- BL21-CodonPlus-RIL competent cells
- pUC 18 DNA Control Plasmid
- XL10-Gold
- 2-Mercaptoethanol

**Special protective equipment for fire-fighters**
- BL21-CodonPlus-RIL competent cells
- pUC 18 DNA Control Plasmid
- XL10-Gold
- 2-Mercaptoethanol

Use an extinguishing agent suitable for the surrounding fire.

None known.

In a fire or if heated, a pressure increase will occur and the container may burst.

In a fire or if heated, a pressure increase will occur and the container may burst.

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.

Decomposition products may include the following materials:
- carbon dioxide
- carbon monoxide
- sulfur oxides
- halogenated compounds
- metal oxide/oxides

No specific data.

Decomposition products may include the following materials:
- carbon dioxide
- carbon monoxide
- sulfur oxides
- halogenated compounds
- metal oxide/oxides

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.

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.

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.

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
Section 5. Firefighting measures

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

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel:
- **BL21-CodonPlus-RIL competent cells**: 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.
- **pUC 18 DNA Control Plasmid**: 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.
- **XL10-Gold 2-Mercaptoethanol**: 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. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders:
- **BL21-CodonPlus-RIL 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".
- **XL10-Gold 2-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:
- **BL21-CodonPlus-RIL 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).
- **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

<table>
<thead>
<tr>
<th>Methods for cleaning up</th>
<th>BL21-CodonPlus-RIL competent cells</th>
</tr>
</thead>
<tbody>
<tr>
<td></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>Protective measures</th>
<th>BL21-CodonPlus-RIL competent cells</th>
</tr>
</thead>
<tbody>
<tr>
<td></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>

<table>
<thead>
<tr>
<th>Advice on general occupational hygiene</th>
<th>BL21-CodonPlus-RIL competent cells</th>
</tr>
</thead>
<tbody>
<tr>
<td></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

<table>
<thead>
<tr>
<th>Conditions for safe storage, including any incompatibilities</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BL21-CodonPlus-RIL competent cells</strong></td>
<td><strong>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.</strong></td>
</tr>
<tr>
<td><strong>pUC 18 DNA Control Plasmid</strong></td>
<td><strong>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.</strong></td>
</tr>
<tr>
<td><strong>XL10-Gold</strong></td>
<td><strong>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.</strong></td>
</tr>
</tbody>
</table>

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>
</table>
| **BL21-CodonPlus-RIL competent cells** | **Safe Work Australia (Australia, 1/2014).**  
**Glycerol**  
TWA: 10 mg/m³ 8 hours.  
**Sucrose**  
TWA: 10 mg/m³ 8 hours. |

#### 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-RIL competent cells: Liquid.
- pUC 18 DNA Control Plasmid: Liquid.
- XL10-Gold: Liquid.
- 2-Mercaptoethanol: Liquid.

#### Colour
- BL21-CodonPlus-RIL competent cells: Not available.
- pUC 18 DNA Control Plasmid: Not available.
- XL10-Gold: Not available.
- 2-Mercaptoethanol: Not available.

#### Odour
- BL21-CodonPlus-RIL competent cells: Not available.
- pUC 18 DNA Control Plasmid: Not available.
- XL10-Gold: Not available.
- 2-Mercaptoethanol: Not available.

#### Odour threshold
- BL21-CodonPlus-RIL competent cells: Not available.
- pUC 18 DNA Control Plasmid: Not available.
- XL10-Gold: Not available.
- 2-Mercaptoethanol: Not available.

#### pH
- BL21-CodonPlus-RIL competent cells: 6.4
- pUC 18 DNA Control Plasmid: 7.5
- XL10-Gold: Not available.
- 2-Mercaptoethanol: Not available.

#### Melting point
- BL21-CodonPlus-RIL 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-RIL competent cells</th>
<th>pUC 18 DNA Control Plasmid</th>
<th>XL10-Gold</th>
<th>2-Mercaptoethanol</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Boiling point</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>100°C (212°F)</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Flash point</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Evaporation rate</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Flammability (solid, gas)</strong></td>
<td>Not applicable.</td>
<td>Not applicable.</td>
<td>Not applicable.</td>
<td>Not applicable.</td>
</tr>
<tr>
<td><strong>Lower and upper explosive (flammable) limits</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Vapour pressure</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Vapour density</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Relative density</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Solubility</strong></td>
<td>Soluble in the following materials: cold water and hot water.</td>
<td>Easily soluble in the following materials: cold water and hot water.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Auto-ignition temperature</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
</tbody>
</table>
## Section 9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>BL21-CodonPlus-RIL competent cells</th>
<th>pUC 18 DNA Control Plasmid</th>
<th>XL10-Gold</th>
<th>2-Mercaptoethanol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viscosity</td>
<td>BL21-CodonPlus-RIL competent cells</td>
<td>pUC 18 DNA Control Plasmid</td>
<td>XL10-Gold</td>
<td>2-Mercaptoethanol</td>
</tr>
</tbody>
</table>

## Section 10. Stability and reactivity

<table>
<thead>
<tr>
<th>Property</th>
<th>BL21-CodonPlus-RIL competent cells</th>
<th>pUC 18 DNA Control Plasmid</th>
<th>XL10-Gold</th>
<th>2-Mercaptoethanol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reactivity</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>Chemical stability</td>
<td>BL21-CodonPlus-RIL competent cells</td>
<td>pUC 18 DNA Control Plasmid</td>
<td>XL10-Gold</td>
<td>2-Mercaptoethanol</td>
</tr>
<tr>
<td></td>
<td>The product is stable.</td>
<td>The product is stable.</td>
<td>The product is stable.</td>
<td></td>
</tr>
<tr>
<td>Possibility of hazardous reactions</td>
<td>BL21-CodonPlus-RIL competent cells</td>
<td>pUC 18 DNA Control Plasmid</td>
<td>XL10-Gold</td>
<td>2-Mercaptoethanol</td>
</tr>
<tr>
<td></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>Conditions to avoid</td>
<td>BL21-CodonPlus-RIL competent cells</td>
<td>pUC 18 DNA Control Plasmid</td>
<td>XL10-Gold</td>
<td>2-Mercaptoethanol</td>
</tr>
<tr>
<td></td>
<td>No specific data.</td>
<td>No specific data.</td>
<td>No specific data.</td>
<td></td>
</tr>
<tr>
<td>Incompatible materials</td>
<td>BL21-CodonPlus-RIL competent cells</td>
<td>pUC 18 DNA Control Plasmid</td>
<td>XL10-Gold</td>
<td>2-Mercaptoethanol</td>
</tr>
<tr>
<td></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>Hazardous decomposition products</td>
<td>BL21-CodonPlus-RIL competent cells</td>
<td>pUC 18 DNA Control Plasmid</td>
<td>XL10-Gold</td>
<td>2-Mercaptoethanol</td>
</tr>
<tr>
<td></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>

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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-RIL competent cells</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>Glycerol</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>XL10-Gold 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>Score</th>
<th>Species</th>
<th>Exposure</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL21-CodonPlus-RIL competent cells</td>
<td>Eyes - Mild irritant</td>
<td>-</td>
<td>Rabbit</td>
<td>24 hours 500 milligrams</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Skin - Mild irritant</td>
<td>-</td>
<td>Rabbit</td>
<td>24 hours 500 milligrams</td>
<td>-</td>
</tr>
<tr>
<td>Glycerol</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>XL10-Gold 2-Mercaptoethanol</td>
<td>Eyes - Severe irritant</td>
<td>-</td>
<td>Rabbit</td>
<td>2 milligrams</td>
<td>-</td>
</tr>
<tr>
<td></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 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-RIL 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.

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Potential acute health effects

### Eye contact
- **BL21-CodonPlus-RIL competent cells**
  - No known significant effects or critical hazards.
- **pUC 18 DNA Control Plasmid**
  - No known significant effects or critical hazards.
- **XL10-Gold 2-Mercaptoethanol**
  - Causes serious eye damage.

### Inhalation
- **BL21-CodonPlus-RIL competent cells**
  - No known significant effects or critical hazards.
- **pUC 18 DNA Control Plasmid**
  - No known significant effects or critical hazards.
- **XL10-Gold 2-Mercaptoethanol**
  - No known significant effects or critical hazards.

### Skin contact
- **BL21-CodonPlus-RIL competent cells**
  - No known significant effects or critical hazards.
- **pUC 18 DNA Control Plasmid**
  - No known significant effects or critical hazards.
- **XL10-Gold 2-Mercaptoethanol**
  - May cause an allergic skin reaction.

### Ingestion
- **BL21-CodonPlus-RIL competent cells**
  - No known significant effects or critical hazards.
- **pUC 18 DNA Control Plasmid**
  - No known significant effects or critical hazards.
- **XL10-Gold 2-Mercaptoethanol**
  - No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

### Eye contact
- **BL21-CodonPlus-RIL competent cells**
  - No specific data.
- **pUC 18 DNA Control Plasmid**
  - No specific data.
- **XL10-Gold 2-Mercaptoethanol**
  - Adverse symptoms may include the following:
    - pain
    - watering
    - redness

### Inhalation
- **BL21-CodonPlus-RIL competent cells**
  - No specific data.
- **pUC 18 DNA Control Plasmid**
  - No specific data.
- **XL10-Gold 2-Mercaptoethanol**
  - No specific data.

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

### Ingestion
- **BL21-CodonPlus-RIL competent cells**
  - No specific data.
- **pUC 18 DNA Control Plasmid**
  - No specific data.
- **XL10-Gold 2-Mercaptoethanol**
  - Adverse symptoms may include the following:
    - stomach pains

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-RIL competent cells
No known significant effects or critical hazards.
pUC 18 DNA Control Plasmid
No known significant effects or critical hazards.
XL10-Gold
No known significant effects or critical hazards.
2-Mercaptoethanol
No known significant effects or critical hazards.

Carcinogenicity
BL21-CodonPlus-RIL competent cells
No known significant effects or critical hazards.
pUC 18 DNA Control Plasmid
No known significant effects or critical hazards.
XL10-Gold
No known significant effects or critical hazards.
2-Mercaptoethanol
No known significant effects or critical hazards.

Mutagenicity
BL21-CodonPlus-RIL competent cells
No known significant effects or critical hazards.
pUC 18 DNA Control Plasmid
No known significant effects or critical hazards.
XL10-Gold
No known significant effects or critical hazards.
2-Mercaptoethanol
No known significant effects or critical hazards.

Teratogenicity
BL21-CodonPlus-RIL competent cells
No known significant effects or critical hazards.
pUC 18 DNA Control Plasmid
No known significant effects or critical hazards.
XL10-Gold
No known significant effects or critical hazards.
2-Mercaptoethanol
No known significant effects or critical hazards.

Developmental effects
BL21-CodonPlus-RIL competent cells
No known significant effects or critical hazards.
pUC 18 DNA Control Plasmid
No known significant effects or critical hazards.
XL10-Gold
No known significant effects or critical hazards.
2-Mercaptoethanol
No known significant effects or critical hazards.

Fertility effects
BL21-CodonPlus-RIL competent cells
No known significant effects or critical hazards.
pUC 18 DNA Control Plasmid
No known significant effects or critical hazards.
XL10-Gold
No known significant effects or critical hazards.
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>XL10-Gold 2-Mercaptoethanol</td>
<td></td>
</tr>
<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-RIL competent cells</td>
<td>Acute LC50 54000 mg/l Fresh water</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
</tbody>
</table>

Persistence and degradability
Not available.

Bioaccumulative potential

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<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-RIL competent cells</td>
<td></td>
<td></td>
<td>low</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>-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

**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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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.
Japan : Japan inventory (ENCS): Not determined.
        Japan inventory (ISHL): Not determined.
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

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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.

Indicates information that has changed from previously issued version.

Notice to reader
Section 16. Any other relevant information

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