SAFETY DATA SHEET

JM101 Competent Cells, Part Number 200234

Section 1. Identification

Product identifier : JM101 Competent Cells, Part Number 200234
Part no. (chemical kit) : 200234
Part no. : JM101 competent cells 200234-41
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.
JM101 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
H332 ACUTE TOXICITY (inhalation) - Category 4
H315 SKIN CORROSION/IRRITATION - Category 2
H318 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1
H317 SKIN SENSITISATION - Category 1
H412 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3

Percentage of the mixture consisting of ingredient(s) of unknown acute dermal toxicity: 1 - 10%
Percentage of the mixture consisting of ingredient(s) of unknown acute inhalation toxicity: 10 - 30%

GHS label elements

Hazard pictograms : Beta Mercaptoethanol

Signal word : JM101 competent cells No signal word.
pUC 18 DNA Control Plasmid No signal word.
Beta Mercaptoethanol DANGER

Hazard statements : JM101 competent cells No known significant effects or critical hazards.
pUC 18 DNA Control Plasmid No known significant effects or critical hazards.
Beta Mercaptoethanol H312 + H332 - Harmful in contact with skin or if inhaled.
H318 - Causes serious eye damage.
H315 - Causes skin irritation.
H317 - May cause an allergic skin reaction.
H412 - Harmful to aquatic life with long lasting effects.

Date of issue/Date of revision : 17/04/2019 Date of previous issue : 21/12/2017 Version : 6
Section 2. Hazard(s) identification

Precautionary statements

Prevention

- **JM101 competent cells**: Not applicable.
- pUC 18 DNA Control Plasmid: Not applicable.

Response

- **JM101 competent cells**: Not applicable.
- pUC 18 DNA Control Plasmid: Not applicable.
- Beta Mercaptoethanol: P304 + P340 + P312 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. P302 + P352 + P312 + P362 + P363 - IF ON SKIN: Wash with plenty of soap and water. Call a POISON CENTER or physician if you feel unwell. Take off contaminated clothing. 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

- **JM101 competent cells**: Not applicable.
- pUC 18 DNA Control Plasmid: Not applicable.
- Beta Mercaptoethanol: Not applicable.

Disposal

- **JM101 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

- **JM101 competent cells**: Not applicable.
- pUC 18 DNA Control Plasmid: Not applicable.
- Beta Mercaptoethanol: Not applicable.

Other hazards which do not result in classification

- **JM101 competent cells**: None known.
- pUC 18 DNA Control Plasmid: None known.
- Beta Mercaptoethanol: None known.

Section 3. Composition and ingredient information

Substance/mixture

- **JM101 competent cells**: Mixture
- pUC 18 DNA Control Plasmid: Mixture
- Beta 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>JM101 competent cells</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>Beta Mercaptoethanol</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**
- JM101 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**
- JM101 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**
- JM101 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.
# Section 4. First aid measures

**Ingestion**

- **JM101 competent cells**
  - Washing the mouth with water. Remove the 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**
  - Washing the mouth with water. Remove the 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.

- **Beta Mercaptoethanol**
  - Get medical attention immediately. Call a poison center or physician. Wash out the mouth with water. Remove dentures if any. Remove the 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

### Eye contact

**Potential acute health effects**

- **JM101 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

**Potential acute health effects**

- **JM101 competent cells**
  - No known significant effects or critical hazards.

- **pUC 18 DNA Control Plasmid**
  - No known significant effects or critical hazards.

- **Beta Mercaptoethanol**
  - Harmful if inhaled.

### Skin contact

**Potential acute health effects**

- **JM101 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

**Potential acute health effects**

- **JM101 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.

### Over-exposure signs/symptoms

#### Eye contact

- **JM101 competent cells**
  - No specific data.

- **pUC 18 DNA Control Plasmid**
  - No specific data.

- **Beta Mercaptoethanol**
  - Adverse symptoms may include the following: pain, watering, redness.
## Section 4. First aid measures

<table>
<thead>
<tr>
<th></th>
<th>JM101 competent cells</th>
<th>pUC 18 DNA Control Plasmid</th>
<th>Beta Mercaptoethanol</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inhalation</strong></td>
<td>No specific data.</td>
<td>No specific data.</td>
<td>No specific data.</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: pain or irritation, redness, blistering may occur</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: stomach pains</td>
</tr>
<tr>
<td><strong>Notes to physician</strong></td>
<td>JM101 competent cells</td>
<td>pUC 18 DNA Control Plasmid</td>
<td>Beta Mercaptoethanol</td>
</tr>
<tr>
<td></td>
<td>Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.</td>
<td>Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.</td>
<td>Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.</td>
</tr>
<tr>
<td><strong>Specific treatments</strong></td>
<td>JM101 competent cells</td>
<td>pUC 18 DNA Control Plasmid</td>
<td>Beta Mercaptoethanol</td>
</tr>
<tr>
<td><strong>Protection of first-aiders</strong></td>
<td>JM101 competent cells</td>
<td>pUC 18 DNA Control Plasmid</td>
<td>Beta Mercaptoethanol</td>
</tr>
<tr>
<td></td>
<td>No action shall be taken involving any personal risk or without suitable training.</td>
<td>No action shall be taken involving any personal risk or without suitable training.</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

<table>
<thead>
<tr>
<th></th>
<th>JM101 competent cells</th>
<th>pUC 18 DNA Control Plasmid</th>
<th>Beta Mercaptoethanol</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Extinguishing media</strong></td>
<td>Use an extinguishing agent suitable for the surrounding fire.</td>
<td>Use an extinguishing agent suitable for the surrounding fire.</td>
<td>Use an extinguishing agent suitable for the surrounding fire.</td>
</tr>
<tr>
<td><strong>Suitable extinguishing media</strong></td>
<td>None known.</td>
<td>None known.</td>
<td>None known.</td>
</tr>
<tr>
<td><strong>Unsuitable extinguishing media</strong></td>
<td>None known.</td>
<td>None known.</td>
<td>None known.</td>
</tr>
</tbody>
</table>

### Date
- Date of issue/Date of revision: 17/04/2019
- Date of previous issue: 21/12/2017
- Version: 6

---

JM101 Competent Cells, Part Number 200234

---
Section 5. Firefighting measures

Specific hazards arising from the chemical

<table>
<thead>
<tr>
<th>Chemical</th>
<th>JM101 competent cells</th>
<th>pUC 18 DNA Control Plasmid</th>
<th>Beta Mercaptoethanol</th>
</tr>
</thead>
<tbody>
<tr>
<td>JM101 competent cells</td>
<td>In a fire or if heated, a pressure increase will occur and the container may burst.</td>
<td>In a fire or if heated, a pressure increase will occur and the container may burst.</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>pUC 18 DNA Control Plasmid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beta Mercaptoethanol</td>
<td></td>
<td>No specific data.</td>
<td>Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides halogenated compounds metal oxide/oxides</td>
</tr>
</tbody>
</table>

Hazardous thermal decomposition products

<table>
<thead>
<tr>
<th>Chemical</th>
<th>JM101 competent cells</th>
<th>pUC 18 DNA Control Plasmid</th>
<th>Beta Mercaptoethanol</th>
</tr>
</thead>
<tbody>
<tr>
<td>JM101 competent cells</td>
<td>Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides halogenated compounds metal oxide/oxides</td>
<td></td>
<td>Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides</td>
</tr>
</tbody>
</table>
Section 6. Accidental release measures

Beta Mercaptoethanol

through spilt material. Put on appropriate personal protective equipment.

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 : JM101 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 : JM101 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 : JM101 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.
### Precautions for safe handling

<table>
<thead>
<tr>
<th><strong>Protective measures</strong></th>
<th><strong>JM101 competent cells</strong></th>
<th>Put on appropriate personal protective equipment (see Section 8).</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>pUC 18 DNA Control Plasmid</strong></td>
<td>Put on appropriate personal protective equipment (see Section 8).</td>
</tr>
<tr>
<td></td>
<td><strong>Beta Mercaptoethanol</strong></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. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. 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><strong>JM101 competent cells</strong></th>
<th>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.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>pUC 18 DNA Control Plasmid</strong></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><strong>Beta Mercaptoethanol</strong></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>

### Conditions for safe storage, including any incompatibilities

<table>
<thead>
<tr>
<th><strong>JM101 competent cells</strong></th>
<th>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.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>pUC 18 DNA Control Plasmid</strong></td>
<td>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.</td>
</tr>
</tbody>
</table>
Section 7. Handling and storage

Beta Mercaptoethanol

Incompatible materials before handling or use. 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. 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>JM101 competent cells</td>
<td>Safe Work Australia (Australia, 4/2018). TWA: 10 mg/m³ 8 hours. DFG MAC-values list (Germany, 7/2017). Absorbed through skin. PEAK: 320 mg/m³, 4 times per shift, 15 minutes. TWA: 160 mg/m³ 8 hours. PEAK: 100 ppm, 4 times per shift, 15 minutes. TWA: 50 ppm 8 hours. Safe Work Australia (Australia, 4/2018). TWA: 10 mg/m³ 8 hours.</td>
</tr>
<tr>
<td>Glycerol</td>
<td></td>
</tr>
<tr>
<td>Dimethyl sulfoxide</td>
<td></td>
</tr>
<tr>
<td>Sucrose</td>
<td></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.
Section 8. Exposure controls and personal 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:
- JM101 competent cells: Liquid.
- pUC 18 DNA Control Plasmid: Liquid.
- Beta Mercaptoethanol: Liquid.

Colour:
- JM101 competent cells: Not available.
- pUC 18 DNA Control Plasmid: Not available.
- Beta Mercaptoethanol: Not available.

Odour:
- JM101 competent cells: Not available.
- pUC 18 DNA Control Plasmid: Not available.
- Beta Mercaptoethanol: Not available.

Odour threshold:
- JM101 competent cells: Not available.
- pUC 18 DNA Control Plasmid: Not available.
- Beta Mercaptoethanol: Not available.

pH:
- JM101 competent cells: 6.4
- pUC 18 DNA Control Plasmid: 7.5
- Beta Mercaptoethanol: Not available.

Melting point:
- JM101 competent cells: Not available.
- pUC 18 DNA Control Plasmid: 0°C (32°F)
- Beta Mercaptoethanol: Not available.

Boiling point:
- JM101 competent cells: Not available.
- pUC 18 DNA Control Plasmid: 100°C (212°F)
- Beta Mercaptoethanol: Not available.

Flash point:
- JM101 competent cells: Not available.
- pUC 18 DNA Control Plasmid: Not available.
- Beta Mercaptoethanol: Not available.

Evaporation rate:
- JM101 competent cells: Not available.
- pUC 18 DNA Control Plasmid: Not available.
- Beta Mercaptoethanol: Not available.

Flammability (solid, gas):
- JM101 competent cells: Not applicable.
- pUC 18 DNA Control Plasmid: Not applicable.
- Beta Mercaptoethanol: Not applicable.

Lower and upper explosive (flammable) limits:
- JM101 competent cells: Not available.
- pUC 18 DNA Control Plasmid: Not available.
- Beta Mercaptoethanol: Not available.

Vapour pressure:
- JM101 competent cells: Not available.
- pUC 18 DNA Control Plasmid: Not available.
- Beta Mercaptoethanol: Not available.

Vapour density:

Date of issue/Date of revision: 17/04/2019
Date of previous issue: 21/12/2017
Version: 6
10/17
### Section 9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>JM101 competent cells</th>
<th>pUC 18 DNA Control Plasmid</th>
<th>Beta Mercaptoethanol</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Relative density</strong></td>
<td>Not available.</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Solubility</strong></td>
<td>JM101 competent cells</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td></td>
<td>pUC 18 DNA Control Plasmid</td>
<td>Easily soluble in the following materials: cold water and hot water.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Beta Mercaptoethanol</td>
<td>Easily soluble in the following materials: cold water and hot water.</td>
<td></td>
</tr>
<tr>
<td><strong>Partition coefficient: n-octanol/water</strong></td>
<td>JM101 competent cells</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td></td>
<td>pUC 18 DNA Control Plasmid</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td></td>
<td>Beta Mercaptoethanol</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Auto-ignition temperature</strong></td>
<td>JM101 competent cells</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td></td>
<td>pUC 18 DNA Control Plasmid</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td></td>
<td>Beta Mercaptoethanol</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Decomposition temperature</strong></td>
<td>JM101 competent cells</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td></td>
<td>pUC 18 DNA Control Plasmid</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td></td>
<td>Beta Mercaptoethanol</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Viscosity</strong></td>
<td>JM101 competent cells</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td></td>
<td>pUC 18 DNA Control Plasmid</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td></td>
<td>Beta Mercaptoethanol</td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

### Section 10. Stability and reactivity

<table>
<thead>
<tr>
<th>Property</th>
<th>JM101 competent cells</th>
<th>pUC 18 DNA Control Plasmid</th>
<th>Beta 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>
</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>
</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>
</tr>
<tr>
<td><strong>Conditions to avoid</strong></td>
<td>No specific data.</td>
<td>No specific data.</td>
<td>No specific data.</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>
</tr>
</tbody>
</table>
Section 10. Stability and reactivity

Hazardous decomposition products

- JM101 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>JM101 competent cells</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>12600 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Glycerol</td>
<td>LD50 Dermal</td>
<td>Rat</td>
<td>40000 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Dimethyl sulfoxide</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 Dermal</td>
<td>Rabbit</td>
<td>167.1 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>2-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>JM101 competent cells</td>
<td>Eyes - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 500 milligrams</td>
<td>-</td>
</tr>
<tr>
<td>Glycerol</td>
<td>Skin - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 500 milligrams</td>
<td>-</td>
</tr>
<tr>
<td>Dimethyl sulfoxide</td>
<td>Eyes - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 500 milligrams</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Eyes - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>100 milligrams</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Skin - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 500 milligrams</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Skin - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>100 milligrams</td>
<td>-</td>
</tr>
<tr>
<td>Beta Mercaptoethanol</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

Conclusion/Summary: Not available.

Carcinogenicity

Conclusion/Summary: Not available.

Reproductive toxicity

Conclusion/Summary: Not available.

Teratogenicity

Conclusion/Summary: Not available.

Specific target organ toxicity (single exposure)
Section 11. Toxicological information

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Route of exposure</th>
<th>Target organs</th>
</tr>
</thead>
<tbody>
<tr>
<td>JM101 Competent Cells</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Part Number 200234</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pUC 18 DNA Control Plasmid</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beta Mercaptoethanol</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-Mercaptoethanol</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Specific target organ toxicity (repeated exposure)
Not available.

Aspiration hazard
Not available.

Information on likely routes of exposure:

- **Inhalation**: JM101 competent cells, pUC 18 DNA Control Plasmid, Beta Mercaptoethanol.
  - Routes of entry anticipated: Oral, Dermal, Inhalation.

Potential acute health effects:

- **Eye contact**: JM101 competent cells, pUC 18 DNA Control Plasmid, Beta Mercaptoethanol.
  - Routes of entry anticipated: Oral, Dermal, Inhalation.
  - No known significant effects or critical hazards.

- **Inhalation**: JM101 competent cells, pUC 18 DNA Control Plasmid, Beta Mercaptoethanol.
  - Routes of entry anticipated: Oral, Dermal, Inhalation.
  - No known significant effects or critical hazards.
  - Causes serious eye damage.

- **Skin contact**: JM101 competent cells, pUC 18 DNA Control Plasmid, Beta Mercaptoethanol.
  - Routes of entry anticipated: Oral, Dermal, Inhalation.
  - No known significant effects or critical hazards.
  - Harmful in contact with skin. Causes skin irritation. May cause an allergic skin reaction.

- **Ingestion**: JM101 competent cells, pUC 18 DNA Control Plasmid, Beta Mercaptoethanol.
  - Routes of entry anticipated: Oral, Dermal, Inhalation.
  - No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics:

- **Eye contact**: JM101 competent cells, pUC 18 DNA Control Plasmid, Beta Mercaptoethanol.
  - No specific data.
  - No specific data.
  - Adverse symptoms may include the following: pain, watering, redness.

- **Inhalation**: JM101 competent cells, pUC 18 DNA Control Plasmid, Beta Mercaptoethanol.
  - No specific data.
  - No specific data.

- **Skin contact**: JM101 competent cells, pUC 18 DNA Control Plasmid, Beta Mercaptoethanol.
  - No specific data.
  - No specific data.
  - Adverse symptoms may include the following: pain or irritation, redness, blistering may occur.

- **Ingestion**: JM101 competent cells, pUC 18 DNA Control Plasmid, Beta Mercaptoethanol.
  - No specific data.
  - No specific data.
  - 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.
**Section 11. Toxicological information**

**Long term exposure**

**Potential immediate effects**: Not available.

**Potential delayed effects**: Not available.

**Potential chronic health effects**

**General**

JM101 competent cells
No known significant effects or critical hazards.

pUC 18 DNA Control Plasmid
No known significant effects or critical hazards.

Beta Mercaptoethanol
Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

**Carcinogenicity**

JM101 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**

JM101 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.

**Teratogenicity**

JM101 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.

**Developmental effects**

JM101 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.

**Fertility effects**

JM101 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.

**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>JM101 competent cells</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycerol</td>
<td>12600</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Dimethyl sulfoxide</td>
<td>14500</td>
<td>40000</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Sucrose</td>
<td>29700</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Beta Mercaptoethanol</td>
<td>2440</td>
<td>1671</td>
<td>N/A</td>
<td>20</td>
<td>N/A</td>
</tr>
<tr>
<td>2-Mercaptoethanol</td>
<td>244</td>
<td>167.1</td>
<td>N/A</td>
<td>2</td>
<td>N/A</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>JM101 competent cells</td>
<td>Acute LC50 54000 mg/l Fresh water</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
<tr>
<td></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 3323 μg/l Marine water</td>
<td>Algae - Nitzschia pungens</td>
<td>96 hours</td>
</tr>
</tbody>
</table>

**Persistence and degradability**

**Date of issue/Date of revision**: 17/04/2019
**Date of previous issue**: 21/12/2017
**Version**: 6
**Section 12. Ecological information**

<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>JM101 competent cells</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>Beta Mercaptoethanol</td>
<td>OECD 310 Ready Biodegradability - CO2 in Sealed Vessels (Headspace Test)</td>
<td>69 % - Inherent - 60 days</td>
<td>20 mg/l</td>
<td>-</td>
</tr>
<tr>
<td>Dimethyl sulfoxide</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sucrose</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Bioaccumulative potential**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>LogP_{ow}</th>
<th>BCF</th>
<th>Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>JM101 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_{oc})**: 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.

**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

International regulations
Chemical Weapon Convention List Schedules I, II & III Chemicals
Not listed.

Montreal Protocol (Annexes A, B, C, E)
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 listed or exempted.
Viet Nam : Not determined.

Section 16. Any other relevant information

History
Date of issue/Date of revision : 17/04/2019
Date of previous issue : 21/12/2017
Version : 6
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
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
N/A = Not available
Section 16. Any other relevant information

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 Tox. 4, H312</td>
<td>Calculation method</td>
</tr>
<tr>
<td>Acute Tox. 4, H332</td>
<td>Calculation method</td>
</tr>
<tr>
<td>Skin Irrit. 2, H315</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

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.