



## Section 2. Hazards identification

### Hazard pictograms



### Signal word

:  L21-CodonPlus(DE3)-RP competent cells Warning

pUC 18 DNA Control Plasmid No signal word.

XL10-Gold 2-Mercaptoethanol Danger

### Hazard statements

:  L21-CodonPlus(DE3)-RP competent cells H320 - Causes eye irritation.

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

XL10-Gold 2-Mercaptoethanol GHS SYMBOL - **Corrosion - Exclamation mark - H318 - Causes serious eye damage.**

H317 - May cause an allergic skin reaction.

### Precautionary statements

#### Prevention

:  L21-CodonPlus(DE3)-RP competent cells P264 - Wash hands thoroughly after handling.

pUC 18 DNA Control Plasmid Not applicable.

XL10-Gold 2-Mercaptoethanol P280 - Wear protective gloves. Wear eye or face protection.

P261 - Avoid breathing vapor.

P272 (OSHA) - Contaminated work clothing must not be allowed out of the workplace.

#### Response

:  L21-CodonPlus(DE3)-RP competent cells P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

pUC 18 DNA Control Plasmid P337 + P313 - If eye irritation persists: Get medical attention.

XL10-Gold 2-Mercaptoethanol Not applicable.

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

:  L21-CodonPlus(DE3)-RP competent cells Not applicable.

pUC 18 DNA Control Plasmid Not applicable.

XL10-Gold 2-Mercaptoethanol Not applicable.

#### Disposal

:  L21-CodonPlus(DE3)-RP competent cells Not applicable.

pUC 18 DNA Control Plasmid Not applicable.

XL10-Gold 2-Mercaptoethanol P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

### Supplemental label elements

:  L21-CodonPlus(DE3)-RP competent cells None known.

pUC 18 DNA Control Plasmid None known.

XL10-Gold 2-Mercaptoethanol None known.

### 2.3 Other hazards

## Section 2. Hazards identification

<b>Hazards not otherwise classified</b>	: BL21-CodonPlus(DE3)-RP competent cells	None known.
	pUC 18 DNA Control Plasmid	None known.
	XL10-Gold 2-Mercaptoethanol	None known.

## Section 3. Composition/information on ingredients

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

Ingredient name	%	CAS number
<b>BL21-CodonPlus(DE3)-RP competent cells</b>		
Glycerol	≥10 - ≤25	56-81-5
Dimethyl sulfoxide	≤10	67-68-5
Potassium chloride	≤3	7447-40-7
<b>XL10-Gold 2-Mercaptoethanol</b>		
Sodium chloride	≥10 - ≤25	7647-14-5
2-Mercaptoethanol	≤5	60-24-2

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

**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

### 4.1 Description of necessary first aid measures

<b>Eye contact</b>	: BL21-CodonPlus(DE3)-RP competent cells	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. If irritation persists, get medical attention.
	pUC 18 DNA Control Plasmid	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.
	XL10-Gold 2-Mercaptoethanol	Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.
<b>Inhalation</b>	: BL21-CodonPlus(DE3)-RP competent cells	Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a

## Section 4. First aid measures

	pUC 18 DNA Control Plasmid	collar, tie, belt or waistband. Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
	XL10-Gold 2-Mercaptoethanol	Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
<b>Skin contact</b>	: BL21-CodonPlus(DE3)-RP competent cells	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.
	pUC 18 DNA Control Plasmid	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	XL10-Gold 2-Mercaptoethanol	Get medical attention immediately. Call a poison center or physician. Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.
<b>Ingestion</b>	: BL21-CodonPlus(DE3)-RP competent cells	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. Get medical attention if adverse health effects persist or are severe. 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.
	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

## Section 4. First aid measures

XL10-Gold 2-Mercaptoethanol

medical attention if symptoms occur. 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.

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

#### Potential acute health effects

<b>Eye contact</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	Causes eye irritation.  No known significant effects or critical hazards. Causes serious eye damage.
<b>Inhalation</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	No known significant effects or critical hazards.  No known significant effects or critical hazards.
<b>Skin contact</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	No known significant effects or critical hazards.  No known significant effects or critical hazards.
<b>Ingestion</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	No known significant effects or critical hazards.  No known significant effects or critical hazards.

#### Over-exposure signs/symptoms

<b>Eye contact</b>	: BL21-CodonPlus(DE3)-RP competent cells  pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following:  irritation watering redness No specific data. Adverse symptoms may include the following: pain watering redness
<b>Inhalation</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	No specific data.  No specific data. No specific data.

## Section 4. First aid measures

<b>Skin contact</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	No specific data.  No specific data. Adverse symptoms may include the following: pain or irritation redness blistering may occur
<b>Ingestion</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	No specific data.  No specific data. Adverse symptoms may include the following: stomach pains

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

<b>Notes to physician</b>	: BL21-CodonPlus(DE3)-RP competent cells  pUC 18 DNA Control Plasmid  XL10-Gold 2-Mercaptoethanol	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.  Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.  Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
<b>Specific treatments</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	No specific treatment.  No specific treatment. No specific treatment.
<b>Protection of first-aiders</b>	: BL21-CodonPlus(DE3)-RP competent cells  pUC 18 DNA Control Plasmid  XL10-Gold 2-Mercaptoethanol	No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.  No action shall be taken involving any personal risk or without suitable training.  No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

## Section 5. Fire-fighting measures

### 5.1 Extinguishing media

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

## Section 5. Fire-fighting measures

### 5.2 Special hazards arising from the substance or mixture

<b>Specific hazards arising from the chemical</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid  XL10-Gold 2-Mercaptoethanol	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.
<b>Hazardous thermal decomposition products</b>	: BL21-CodonPlus(DE3)-RP competent cells   pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	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

### 5.3 Advice for firefighters

<b>Special protective actions for fire-fighters</b>	: BL21-CodonPlus(DE3)-RP competent cells  pUC 18 DNA Control Plasmid  XL10-Gold 2-Mercaptoethanol	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.
<b>Special protective equipment for fire-fighters</b>	: BL21-CodonPlus(DE3)-RP competent cells  pUC 18 DNA Control Plasmid  XL10-Gold 2-Mercaptoethanol	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

## Section 6. Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

<b>For non-emergency personnel</b>	: BL21-CodonPlus(DE3)-RP 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 spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. 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 spilled 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 spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
<b>For emergency responders</b>	: BL21-CodonPlus(DE3)-RP competent cells	If specialized 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 specialized 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 specialized 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".
<b>6.2 Environmental precautions</b>	: BL21-CodonPlus(DE3)-RP competent cells	Avoid dispersal of spilled 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 spilled 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 spilled 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).

### 6.3 Methods and materials for containment and cleaning up



## Section 6. Accidental release measures

<b>Methods for cleaning up</b>	: BL21-CodonPlus(DE3)-RP 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.
	XL10-Gold 2-Mercaptoethanol	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

## Section 7. Handling and storage

### 7.1 Precautions for safe handling

<b>Protective measures</b>	: BL21-CodonPlus(DE3)-RP competent cells	Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. 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.
	pUC 18 DNA Control Plasmid	Put on appropriate personal protective equipment (see Section 8).
	XL10-Gold 2-Mercaptoethanol	Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. 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.
<b>Advice on general occupational hygiene</b>	: BL21-CodonPlus(DE3)-RP competent cells	Potentially biohazardous material. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
	pUC 18 DNA Control Plasmid	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8

## Section 7. Handling and storage

XL10-Gold 2-Mercaptoethanol

for additional information on hygiene measures. 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.

### 7.2 Conditions for safe storage, including any incompatibilities

: BL21-CodonPlus(DE3)-RP competent cells

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

pUC 18 DNA Control Plasmid

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

XL10-Gold 2-Mercaptoethanol

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

### 7.3 Specific end use(s)

#### Recommendations

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

Industrial applications, Professional applications.

Industrial applications, Professional applications.

Industrial applications, Professional applications.

#### Industrial sector specific solutions

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

Not applicable.

Not applicable.

Not applicable.

## Section 8. Exposure controls/personal protection

### 8.1 Control parameters

#### Occupational exposure limits

Ingredient name	Exposure limits
<b>BL21-CodonPlus(DE3)-RP competent cells</b> Glycerol  Dimethyl sulfoxide  Potassium chloride	<b>OSHA PEL 1989 (United States, 3/1989).</b> TWA: 5 mg/m <sup>3</sup> 8 hours. Form: Respirable fraction TWA: 10 mg/m <sup>3</sup> 8 hours. Form: Total dust <b>OSHA PEL (United States, 2/2013).</b> TWA: 5 mg/m <sup>3</sup> 8 hours. Form: Respirable fraction TWA: 15 mg/m <sup>3</sup> 8 hours. Form: Total dust
<b>XL10-Gold 2-Mercaptoethanol</b> Sodium chloride 2-Mercaptoethanol	<b>AIHA WEEL (United States, 10/2011).</b> TWA: 250 ppm 8 hours. None.  None. <b>AIHA WEEL (United States, 10/2011).</b> <b>Absorbed through skin.</b> TWA: 0.2 ppm 8 hours.

### 8.2 Exposure controls

#### Appropriate engineering controls

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

#### Environmental exposure controls

- : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

### Individual protection measures

#### Hygiene measures

- : Handle as biohazard material (Biosafety level 1). Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

#### Eye/face protection

- : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

#### Skin protection

##### Hand protection

- : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

## Section 8. Exposure controls/personal protection

- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

## Section 9. Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

#### Appearance

<b>Physical state</b>	: BL21-CodonPlus(DE3)-RP competent cells	Liquid.
	pUC 18 DNA Control Plasmid	Liquid.
	XL10-Gold 2-Mercaptoethanol	Liquid.
<b>Color</b>	: BL21-CodonPlus(DE3)-RP competent cells	Not available.
	pUC 18 DNA Control Plasmid	Not available.
	XL10-Gold 2-Mercaptoethanol	Not available.
<b>Odor</b>	: BL21-CodonPlus(DE3)-RP competent cells	Not available.
	pUC 18 DNA Control Plasmid	Not available.
	XL10-Gold 2-Mercaptoethanol	Not available.
<b>Odor threshold</b>	: BL21-CodonPlus(DE3)-RP competent cells	Not available.
	pUC 18 DNA Control Plasmid	Not available.
	XL10-Gold 2-Mercaptoethanol	Not available.
<b>pH</b>	: BL21-CodonPlus(DE3)-RP competent cells	6.4
	pUC 18 DNA Control Plasmid	7.5
	XL10-Gold 2-Mercaptoethanol	Not available.
<b>Melting point</b>	: BL21-CodonPlus(DE3)-RP competent cells	Not available.
	pUC 18 DNA Control Plasmid	0°C (32°F)
	XL10-Gold 2-Mercaptoethanol	Not available.
<b>Boiling point</b>	: BL21-CodonPlus(DE3)-RP competent cells	Not available.
	pUC 18 DNA Control Plasmid	100°C (212°F)
	XL10-Gold 2-Mercaptoethanol	Not available.
<b>Flash point</b>	: BL21-CodonPlus(DE3)-RP competent cells	Not available.
	pUC 18 DNA Control Plasmid	Not available.
	XL10-Gold 2-Mercaptoethanol	Not available.
<b>Evaporation rate</b>	: BL21-CodonPlus(DE3)-RP competent cells	Not available.
	pUC 18 DNA Control Plasmid	Not available.
	XL10-Gold 2-Mercaptoethanol	Not available.
<b>Flammability (solid, gas)</b>	: BL21-CodonPlus(DE3)-RP competent cells	Not applicable.
	pUC 18 DNA Control Plasmid	Not applicable.
	XL10-Gold 2-Mercaptoethanol	Not applicable.

## Section 9. Physical and chemical properties

<b>Lower and upper explosive (flammable) limits</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	Not available. Not available. Not available.
<b>Vapor pressure</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	Not available. Not available. Not available.
<b>Vapor density</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	Not available. Not available. Not available.
<b>Relative density</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	Not available. Not available. Not available.
<b>Solubility</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid  XL10-Gold 2-Mercaptoethanol	Soluble in the following materials: cold water and hot water. Easily soluble in the following materials: cold water and hot water. Easily soluble in the following materials: cold water and hot water.
<b>Partition coefficient: n-octanol/water</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	Not available. Not available. Not available.
<b>Auto-ignition temperature</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	Not available. Not available. Not available.
<b>Decomposition temperature</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	Not available. Not available. Not available.
<b>Viscosity</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	Not available. Not available. Not available.

## Section 10. Stability and reactivity

<b>10.1 Reactivity</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid  XL10-Gold 2-Mercaptoethanol	No specific test data related to reactivity available for this product or its ingredients. No specific test data related to reactivity available for this product or its ingredients. No specific test data related to reactivity available for this product or its ingredients.
<b>10.2 Chemical stability</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	The product is stable.  The product is stable. The product is stable.

## Section 10. Stability and reactivity

<b>10.3 Possibility of hazardous reactions</b>	<ul style="list-style-type: none"> <li>: BL21-CodonPlus(DE3)-RP competent cells</li> <li>pUC 18 DNA Control Plasmid</li> <li>XL10-Gold 2-Mercaptoethanol</li> </ul>	<p>Under normal conditions of storage and use, hazardous reactions will not occur.</p> <p>Under normal conditions of storage and use, hazardous reactions will not occur.</p> <p>Under normal conditions of storage and use, hazardous reactions will not occur.</p>
<b>10.4 Conditions to avoid</b>	<ul style="list-style-type: none"> <li>: BL21-CodonPlus(DE3)-RP competent cells</li> <li>pUC 18 DNA Control Plasmid</li> <li>XL10-Gold 2-Mercaptoethanol</li> </ul>	<p>No specific data.</p> <p>No specific data.</p> <p>No specific data.</p>
<b>10.5 Incompatible materials</b>	<ul style="list-style-type: none"> <li>: BL21-CodonPlus(DE3)-RP competent cells</li> <li>pUC 18 DNA Control Plasmid</li> <li>XL10-Gold 2-Mercaptoethanol</li> </ul>	<p>May react or be incompatible with oxidizing materials.</p> <p>May react or be incompatible with oxidizing materials.</p> <p>May react or be incompatible with oxidizing materials.</p>
<b>10.6 Hazardous decomposition products</b>	<ul style="list-style-type: none"> <li>: BL21-CodonPlus(DE3)-RP competent cells</li> <li>pUC 18 DNA Control Plasmid</li> <li>XL10-Gold 2-Mercaptoethanol</li> </ul>	<p>Under normal conditions of storage and use, hazardous decomposition products should not be produced.</p> <p>Under normal conditions of storage and use, hazardous decomposition products should not be produced.</p> <p>Under normal conditions of storage and use, hazardous decomposition products should not be produced.</p>

## Section 11. Toxicological information

### 11.1 Information on toxicological effects

#### Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
<b>BL21-CodonPlus(DE3)-RP competent cells</b>				
Glycerol	LD50 Oral	Rat	12600 mg/kg	-
Dimethyl sulfoxide	LD50 Dermal	Rat	40000 mg/kg	-
	LD50 Oral	Rat	14500 mg/kg	-
Potassium chloride	LD50 Oral	Rat	2600 mg/kg	-
<b>XL10-Gold 2-Mercaptoethanol</b>				
Sodium chloride	LD50 Oral	Rat	3000 mg/kg	-
2-Mercaptoethanol	LD50 Dermal	Rabbit	200 mg/kg	-
	LD50 Oral	Rat	244 mg/kg	-

#### Irritation/Corrosion

## Section 11. Toxicological information

Product/ingredient name	Result	Species	Score	Exposure	Observation
<b>BL21-CodonPlus(DE3)-RP competent cells</b>					
Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
Dimethyl sulfoxide	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Eyes - Mild irritant	Rabbit	-	100 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	100 milligrams	-
Potassium chloride	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
<b>XL10-Gold 2-Mercaptoethanol</b>					
Sodium chloride	Eyes - Moderate irritant	Rabbit	-	24 hours 100 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	10 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
2-Mercaptoethanol	Eyes - Severe irritant	Rabbit	-	2 milligrams	-

### Sensitization

Not available.

### Mutagenicity

Not available.

### Carcinogenicity

Not available.

### Reproductive toxicity

Not available.

### Teratogenicity

Not available.

### Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
<b>XL10-Gold 2-Mercaptoethanol</b> 2-Mercaptoethanol	Category 3	Not applicable.	Respiratory tract irritation

### Specific target organ toxicity (repeated exposure)

Not available.

### Aspiration hazard

Not available.

## Section 11. Toxicological information

<b>Information on the likely routes of exposure</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	Routes of entry anticipated: Oral, Dermal, Inhalation. Not available. Routes of entry anticipated: Oral, Dermal, Inhalation.
<b><u>Potential acute health effects</u></b>		
<b>Eye contact</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	Causes eye irritation.  No known significant effects or critical hazards. Causes serious eye damage.
<b>Inhalation</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	No known significant effects or critical hazards.  No known significant effects or critical hazards.
<b>Skin contact</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	No known significant effects or critical hazards.  No known significant effects or critical hazards.
<b>Ingestion</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	No known significant effects or critical hazards.  No known significant effects or critical hazards.

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

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

### Delayed and immediate effects and also chronic effects from short and long term exposure

#### Short term exposure

**Potential immediate effects** : Not available.



## Section 11. Toxicological information

**Potential delayed effects** : Not available.

### Long term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

### Potential chronic health effects

<b>General</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	No known significant effects or critical hazards.  No known significant effects or critical hazards. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
<b>Carcinogenicity</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	No known significant effects or critical hazards.  No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Mutagenicity</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	No known significant effects or critical hazards.  No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Teratogenicity</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	No known significant effects or critical hazards.  No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Developmental effects</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	No known significant effects or critical hazards.  No known significant effects or critical hazards. No known significant effects or critical hazards.
<b>Fertility effects</b>	: BL21-CodonPlus(DE3)-RP competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	No known significant effects or critical hazards.  No known significant effects or critical hazards. No known significant effects or critical hazards.

### Numerical measures of toxicity

#### Acute toxicity estimates

Route	ATE value
BL21-CodonPlus(DE3)-RP competent cells Oral	136842.1 mg/kg
XL10-Gold 2-Mercaptoethanol Oral	4615.5 mg/kg
Dermal	4545.5 mg/kg
Inhalation (vapors)	45.45 mg/l

## Section 12. Ecological information

### 12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
<b>BL21-CodonPlus(DE3)-RP competent cells</b>			
Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
Dimethyl sulfoxide	Acute LC50 25000 ppm Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
	Acute LC50 34000000 µg/l Fresh water	Fish - Pimephales promelas	96 hours
Potassium chloride	Chronic NOEC 100 µl/L Marine water	Algae - Ulva lactuca	72 hours
	Acute EC50 1337000 µg/l Fresh water	Algae - Navicula seminulum	96 hours
	Acute EC50 9.24 g/L Fresh water	Algae - Desmodesmus subspicatus	72 hours
	Acute EC50 141460 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 12.77 mg/l Fresh water	Crustaceans - Pseudosida ramosa - Neonate	48 hours
	Acute LC50 880000 µg/l Fresh water	Fish - Pimephales promelas	96 hours
<b>XL10-Gold 2-Mercaptoethanol</b>			
Sodium chloride	Acute EC50 2430000 µg/l Fresh water	Algae - Navicula seminulum	96 hours
	Acute EC50 519.6 mg/l Fresh water	Crustaceans - Cypris subglobosa	48 hours
	Acute IC50 6.87 g/L Fresh water	Aquatic plants - Lemna minor	96 hours
	Acute LC50 1661 mg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 1000000 µg/l Fresh water	Fish - Morone saxatilis - Larvae	96 hours
	Chronic LC10 781 mg/l Fresh water	Crustaceans - Hyalella azteca - Juvenile (Fledgling, Hatchling, Weanling)	3 weeks
	Chronic NOEC 6 g/L Fresh water	Aquatic plants - Lemna minor	96 hours
	Chronic NOEC 0.314 g/L Fresh water	Daphnia - Daphnia pulex	21 days
	Chronic NOEC 100 mg/l Fresh water	Fish - Gambusia holbrooki - Adult	8 weeks

### 12.2 Persistence and degradability

Not available.

### 12.3 Bioaccumulative potential

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
<b>BL21-CodonPlus(DE3)-RP competent cells</b>			
Glycerol	-1.76	-	low
Dimethyl sulfoxide	-1.35	3.16	low
Potassium chloride	-0.46	-	low
<b>XL10-Gold 2-Mercaptoethanol</b>			
2-Mercaptoethanol	-0.056	-	low

### 12.4 Mobility in soil

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

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

## Section 13. Disposal considerations

### 13.1 Waste treatment methods

**Disposal methods** : The generation of waste should be avoided or minimized 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 spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.

The information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

## Section 14. Transport information

### Regulatory information

**DOT / IMDG / IATA** : Not regulated.

## Section 15. Regulatory information

### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

**U.S. Federal regulations** : **United States inventory (TSCA 8b)**: All components are listed or exempted.  
**Clean Water Act (CWA) 311**: Edetic acid

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** :  Listed

**Clean Air Act Section 602 Class I Substances** : Not listed

**Clean Air Act Section 602 Class II Substances** : Not listed

**DEA List I Chemicals (Precursor Chemicals)** : Not listed

**DEA List II Chemicals (Essential Chemicals)** : Not listed

### SARA 302/304

#### Composition/information on ingredients

No products were found.

**SARA 304 RQ** : Not applicable.

### SARA 311/312

**Classification** : Immediate (acute) health hazard

## Section 15. Regulatory information

### Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
<b>BL21-CodonPlus(DE3)-RP competent cells</b>						
Glycerol	≥10 - ≤25	No.	No.	No.	Yes.	No.
Dimethyl sulfoxide	≤10	Yes.	No.	No.	Yes.	No.
Potassium chloride	≤3	No.	No.	No.	Yes.	No.
<b>XL10-Gold 2-Mercaptoethanol</b>						
Sodium chloride	≥10 - ≤25	No.	No.	No.	Yes.	No.
2-Mercaptoethanol	≤5	Yes.	No.	No.	Yes.	No.

### State regulations

#### Massachusetts

: The following components are listed: SUCROSE DUST; GLYCERINE MIST; 2-MERCAPTOETHANOL

#### New York

: None of the components are listed.

#### New Jersey

: The following components are listed: DIMETHYL SULFOXIDE; METHANE, SULFINYLBI-; GLYCERIN; 1,2,3-PROPANETRIOL; THIOGLYCOL; 2-MERCAPTOETHANOL

#### Pennsylvania

: The following components are listed: .ALPHA.-D-GLUCOPYRANOSIDE, .BETA.-D-FRUCTOFURANOSYL; 1,2,3-PROPANETRIOL; ETHANOL, 2-MERCAPTO-

### California Prop. 65

No products were found.

### 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 inventory

: 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.

## Section 15. Regulatory information

<b>Republic of Korea</b>	: All components are listed or exempted.
<b>Taiwan</b>	: All components are listed or exempted.
<b>Turkey</b>	: <input checked="" type="checkbox"/> Not determined.

## Section 16. Other information

### History

<b>Date of issue</b>	: 10/17/2016
<b>Date of previous issue</b>	: 08/31/2015.
<b>Version</b>	: 5

Indicates information that has changed from previously issued version.

### Notice to reader

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