

Section 2. Hazards identification

Hazard pictograms



Signal word

: ArcticExpress competent cells
pUC 18 DNA Control Plasmid
XL10-Gold 2-Mercaptoethanol

Warning
No signal word.
Danger

Hazard statements

: ArcticExpress competent cells
pUC 18 DNA Control Plasmid
XL10-Gold 2-Mercaptoethanol

H320 - Causes eye irritation.
No known significant effects or critical hazards.
GHS SYMBOL - **Corrosion - Exclamation mark** -
H318 - Causes serious eye damage.
H317 - May cause an allergic skin reaction.

Precautionary statements

Prevention

: ArcticExpress competent cells
pUC 18 DNA Control Plasmid
XL10-Gold 2-Mercaptoethanol

P264 - Wash hands thoroughly after handling.
Not applicable.
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

: ArcticExpress competent cells

pUC 18 DNA Control Plasmid
XL10-Gold 2-Mercaptoethanol

P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337 + P313 - If eye irritation persists: Get medical attention.
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

: ArcticExpress competent cells
pUC 18 DNA Control Plasmid
XL10-Gold 2-Mercaptoethanol

Not applicable.
Not applicable.
Not applicable.

Disposal

: ArcticExpress competent cells
pUC 18 DNA Control Plasmid
XL10-Gold 2-Mercaptoethanol

Not applicable.
Not applicable.
P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements

: ArcticExpress competent cells
pUC 18 DNA Control Plasmid
XL10-Gold 2-Mercaptoethanol

None known.
None known.
None known.

2.3 Other hazards

Hazards not otherwise classified

: ArcticExpress competent cells
pUC 18 DNA Control Plasmid
XL10-Gold 2-Mercaptoethanol

None known.
None known.
None known.

Section 3. Composition/information on ingredients

Substance/mixture	: ArcticExpress competent cells	Mixture
	pUC 18 DNA Control Plasmid	Mixture
	XL10-Gold 2-Mercaptoethanol	Mixture

Ingredient name	%	CAS number
ArcticExpress competent cells		
Glycerol	≥10 - ≤25	56-81-5
Dimethyl sulfoxide	≤10	67-68-5
Potassium chloride	≤3	7447-40-7
XL10-Gold 2-Mercaptoethanol		
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

Eye contact	: ArcticExpress 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.
Inhalation	: ArcticExpress 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 collar, tie, belt or waistband.
	pUC 18 DNA Control Plasmid	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
	XL10-Gold 2-Mercaptoethanol	Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for

Section 4. First aid measures

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 : ArcticExpress 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.

Ingestion : ArcticExpress 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 medical attention if symptoms occur.

XL10-Gold 2-Mercaptoethanol

Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities

Section 4. First aid measures

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

Eye contact	: ArcticExpress 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.
Inhalation	: ArcticExpress 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.
Skin contact	: ArcticExpress 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. May cause an allergic skin reaction.
Ingestion	: ArcticExpress 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.

Over-exposure signs/symptoms

Eye contact	: ArcticExpress 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
Inhalation	: ArcticExpress competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	No specific data. No specific data. No specific data.
Skin contact	: ArcticExpress 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
Ingestion	: ArcticExpress 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

Section 4. First aid measures

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

See toxicological information (Section 11)

Section 5. Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media	: ArcticExpress competent cells	Use an extinguishing agent suitable for the surrounding fire.
	pUC 18 DNA Control Plasmid	Use an extinguishing agent suitable for the surrounding fire.
	XL10-Gold 2-Mercaptoethanol	Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media	: ArcticExpress competent cells	None known.
	pUC 18 DNA Control Plasmid	None known.
	XL10-Gold 2-Mercaptoethanol	None known.

5.2 Special hazards arising from the substance or mixture

Specific hazards arising from the chemical	: ArcticExpress competent cells	In a fire or if heated, a pressure increase will occur and the container may burst.
	pUC 18 DNA Control Plasmid	In a fire or if heated, a pressure increase will occur and the container may burst.
	XL10-Gold 2-Mercaptoethanol	In a fire or if heated, a pressure increase will occur and the container may burst.
Hazardous thermal decomposition products	: ArcticExpress competent cells	Decomposition products may include the following materials:
	pUC 18 DNA Control Plasmid	carbon dioxide
		carbon monoxide
		sulfur oxides
		halogenated compounds
		metal oxide/oxides
		No specific data.

Section 5. Fire-fighting measures

XL10-Gold 2-Mercaptoethanol

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

5.3 Advice for firefighters

Special protective actions for fire-fighters

: ArcticExpress competent cells

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.

pUC 18 DNA Control Plasmid

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.

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.

Special protective equipment for fire-fighters

: ArcticExpress competent cells

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

pUC 18 DNA Control Plasmid

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

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.

Section 6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

: ArcticExpress 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

Section 6. Accidental release measures

	<p>For emergency responders : ArcticExpress competent cells</p>	<p>ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.</p>
	<p>pUC 18 DNA Control Plasmid</p>	<p>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".</p>
	<p>XL10-Gold 2-Mercaptoethanol</p>	<p>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".</p>
<p>6.2 Environmental precautions</p>	<p>: ArcticExpress competent cells</p>	<p>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).</p>
	<p>pUC 18 DNA Control Plasmid</p>	<p>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).</p>
	<p>XL10-Gold 2-Mercaptoethanol</p>	<p>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).</p>
<p>6.3 Methods and materials for containment and cleaning up</p>	<p>Methods for cleaning up : ArcticExpress competent cells</p>	<p>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.</p>
	<p>pUC 18 DNA Control Plasmid</p>	<p>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.</p>
	<p>XL10-Gold 2-Mercaptoethanol</p>	<p>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.</p>

Section 7. Handling and storage

7.1 Precautions for safe handling

Protective measures	: ArcticExpress 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.
Advice on general occupational hygiene	: ArcticExpress competent cells	Potentially biohazardous material. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
	pUC 18 DNA Control Plasmid	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
	XL10-Gold 2-Mercaptoethanol	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
7.2 Conditions for safe storage, including any incompatibilities	: ArcticExpress 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.

Section 7. Handling and storage

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

: ArcticExpress 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

: ArcticExpress 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
ArcticExpress competent cells	<p>OSHA PEL 1989 (United States, 3/1989). TWA: 5 mg/m³ 8 hours. Form: Respirable fraction</p> <p>TWA: 10 mg/m³ 8 hours. Form: Total dust</p> <p>OSHA PEL (United States, 2/2013). TWA: 5 mg/m³ 8 hours. Form: Respirable fraction</p> <p>TWA: 15 mg/m³ 8 hours. Form: Total dust</p> <p>AIHA WEEL (United States, 10/2011). TWA: 250 ppm 8 hours.</p> <p>None.</p> <p>None.</p> <p>AIHA WEEL (United States, 10/2011). Absorbed through skin. TWA: 0.2 ppm 8 hours.</p>
Glycerol	
Dimethyl sulfoxide	
Potassium chloride	
XL10-Gold 2-Mercaptoethanol	
Sodium chloride	
2-Mercaptoethanol	

8.2 Exposure controls

Section 8. Exposure controls/personal protection

- 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.
- 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

Physical state	: <input checked="" type="checkbox"/> ArcticExpress competent cells	Liquid.
	pUC 18 DNA Control Plasmid	Liquid.
	XL10-Gold 2-Mercaptoethanol	Liquid.
Color	: <input checked="" type="checkbox"/> ArcticExpress competent cells	Not available.
	pUC 18 DNA Control Plasmid	Not available.
	XL10-Gold 2-Mercaptoethanol	Not available.
Odor	: <input checked="" type="checkbox"/> ArcticExpress competent cells	Not available.
	pUC 18 DNA Control Plasmid	Not available.
	XL10-Gold 2-Mercaptoethanol	Not available.
Odor threshold	: <input checked="" type="checkbox"/> ArcticExpress competent cells	Not available.
	pUC 18 DNA Control Plasmid	Not available.
	XL10-Gold 2-Mercaptoethanol	Not available.

Section 9. Physical and chemical properties

pH	: ArcticExpress competent cells	6.4
	pUC 18 DNA Control Plasmid	7.5
	XL10-Gold 2-Mercaptoethanol	Not available.
Melting point	: ArcticExpress competent cells	Not available.
	pUC 18 DNA Control Plasmid	0°C (32°F)
	XL10-Gold 2-Mercaptoethanol	Not available.
Boiling point	: ArcticExpress competent cells	Not available.
	pUC 18 DNA Control Plasmid	100°C (212°F)
	XL10-Gold 2-Mercaptoethanol	Not available.
Flash point	: ArcticExpress competent cells	Not available.
	pUC 18 DNA Control Plasmid	Not available.
	XL10-Gold 2-Mercaptoethanol	Not available.
Evaporation rate	: ArcticExpress competent cells	Not available.
	pUC 18 DNA Control Plasmid	Not available.
	XL10-Gold 2-Mercaptoethanol	Not available.
Flammability (solid, gas)	: ArcticExpress competent cells	Not applicable.
	pUC 18 DNA Control Plasmid	Not applicable.
	XL10-Gold 2-Mercaptoethanol	Not applicable.
Lower and upper explosive (flammable) limits	: ArcticExpress competent cells	Not available.
	pUC 18 DNA Control Plasmid	Not available.
	XL10-Gold 2-Mercaptoethanol	Not available.
Vapor pressure	: ArcticExpress competent cells	Not available.
	pUC 18 DNA Control Plasmid	Not available.
	XL10-Gold 2-Mercaptoethanol	Not available.
Vapor density	: ArcticExpress competent cells	Not available.
	pUC 18 DNA Control Plasmid	Not available.
	XL10-Gold 2-Mercaptoethanol	Not available.
Relative density	: ArcticExpress competent cells	Not available.
	pUC 18 DNA Control Plasmid	Not available.
	XL10-Gold 2-Mercaptoethanol	Not available.
Solubility	: ArcticExpress competent cells	Easily soluble in the following materials: cold water and hot water.
	pUC 18 DNA Control Plasmid	Easily soluble in the following materials: cold water and hot water.
	XL10-Gold 2-Mercaptoethanol	Easily soluble in the following materials: cold water and hot water.
Partition coefficient: n-octanol/water	: ArcticExpress competent cells	Not available.
	pUC 18 DNA Control Plasmid	Not available.
	XL10-Gold 2-Mercaptoethanol	Not available.
Auto-ignition temperature	: ArcticExpress competent cells	Not available.
	pUC 18 DNA Control Plasmid	Not available.
	XL10-Gold 2-Mercaptoethanol	Not available.
Decomposition temperature	: ArcticExpress competent cells	Not available.
	pUC 18 DNA Control Plasmid	Not available.
	XL10-Gold 2-Mercaptoethanol	Not available.
Viscosity	: ArcticExpress competent cells	Not available.
	pUC 18 DNA Control Plasmid	Not available.
	XL10-Gold 2-Mercaptoethanol	Not available.

Section 10. Stability and reactivity

10.1 Reactivity	: ArcticExpress 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.
10.2 Chemical stability	: ArcticExpress competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	The product is stable. The product is stable. The product is stable.
10.3 Possibility of hazardous reactions	: ArcticExpress competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous reactions will not occur.
10.4 Conditions to avoid	: ArcticExpress competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	No specific data. No specific data. No specific data.
10.5 Incompatible materials	: ArcticExpress competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	May react or be incompatible with oxidizing materials. May react or be incompatible with oxidizing materials. May react or be incompatible with oxidizing materials.
10.6 Hazardous decomposition products	: ArcticExpress competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	Under normal conditions of storage and use, hazardous decomposition products should not be produced. Under normal conditions of storage and use, hazardous decomposition products should not be produced. Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
ArcticExpress competent cells				
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	-
XL10-Gold 2-Mercaptoethanol				
Sodium chloride	LD50 Oral	Rat	3000 mg/kg	-
2-Mercaptoethanol	LD50 Dermal	Rabbit	200 mg/kg	-

Section 11. Toxicological information

	LD50 Oral	Rat	244 mg/kg	-
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Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
ArcticExpress competent cells					
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	-
XL10-Gold 2-Mercaptoethanol					
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
XL10-Gold 2-Mercaptoethanol 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

Information on the likely routes of exposure	: ArcticExpress 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.
<u>Potential acute health effects</u>		
Eye contact	: ArcticExpress 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.
Inhalation	: ArcticExpress 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.
Skin contact	: ArcticExpress 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. May cause an allergic skin reaction.
Ingestion	: ArcticExpress 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.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact	: ArcticExpress 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
Inhalation	: ArcticExpress competent cells pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	No specific data. No specific data. No specific data.
Skin contact	: ArcticExpress 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
Ingestion	: ArcticExpress 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

<u>Short term exposure</u>	
Potential immediate effects	: Not available.
Potential delayed effects	: Not available.
<u>Long term exposure</u>	
Potential immediate effects	: Not available.
Potential delayed effects	: Not available.

Section 11. Toxicological information

Potential chronic health effects

General	: ArcticExpress 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.
Carcinogenicity	: ArcticExpress 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.
Mutagenicity	: ArcticExpress 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.
Teratogenicity	: ArcticExpress 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.
Developmental effects	: ArcticExpress 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.
Fertility effects	: ArcticExpress 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
ArcticExpress 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
ArcticExpress competent cells			
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
Potassium chloride	Acute LC50 34000000 µg/l Fresh water	Fish - Pimephales promelas	96 hours
	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 - Desmodemus 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

Section 12. Ecological information

XL10-Gold 2-Mercaptoethanol Sodium chloride	Acute EC50 2430000 µg/l Fresh water Acute EC50 519.6 mg/l Fresh water Acute IC50 6.87 g/L Fresh water Acute LC50 1661 mg/l Fresh water Acute LC50 1000000 µg/l Fresh water Chronic LC10 781 mg/l Fresh water	Algae - Navicula seminulum Crustaceans - Cypris subglobosa Aquatic plants - Lemna minor Daphnia - Daphnia magna Fish - Morone saxatilis - Larvae Crustaceans - Hyalella azteca - Juvenile (Fledgling, Hatchling, Weanling)	96 hours 48 hours 96 hours 48 hours 96 hours 3 weeks
	Chronic NOEC 6 g/L Fresh water Chronic NOEC 0.314 g/L Fresh water Chronic NOEC 100 mg/l Fresh water	Aquatic plants - Lemna minor Daphnia - Daphnia pulex Fish - Gambusia holbrooki - Adult	96 hours 21 days 8 weeks

12.2 Persistence and degradability

Not available.

12.3 Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
ArcticExpress competent cells			
Glycerol	-1.76	-	low
Dimethyl sulfoxide	-1.35	3.16	low
Potassium chloride	-0.46	-	low
XL10-Gold			
2-Mercaptoethanol			
2-Mercaptoethanol	-0.056	-	low

12.4 Mobility in soil

Soil/water partition coefficient (K_{oc}) : 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.

Section 13. Disposal considerations

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

Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
ArcticExpress competent cells						
Glycerol	≥10 - ≤25	No.	No.	No.	Yes.	No.
Dimethyl sulfoxide	≤10	Yes.	No.	No.	Yes.	No.
Potassium chloride	≤3	No.	No.	No.	Yes.	No.
XL10-Gold 2-Mercaptoethanol						
Sodium chloride	≥10 - ≤25	No.	No.	No.	Yes.	No.

Section 15. Regulatory information

2-Mercaptoethanol	≤5	Yes.	No.	No.	Yes.	No.
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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.
- Republic of Korea** : All components are listed or exempted.
- Taiwan** : All components are listed or exempted.
- Turkey** : Not determined.

Section 16. Other information

History

- Date of issue** : 10/18/2016
- Date of previous issue** : 08/24/2015.
- Version** : 5

Indicates information that has changed from previously issued version.

Notice to reader

Section 16. Other information

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