

SAFETY DATA SHEET

ArcticExpress (DE3) Competent Cells, Part Number 230192

Section 1. Identification

Product identifier : ArcticExpress (DE3) Competent Cells, Part Number 230192

Part no. (chemical kit) : 230192

Part no. : pUC 18 DNA Control Plasmid 200231-42
 XL10-Gold 2-Mercaptoethanol 200314-43
 ArcticExpress (DE3) competent cells 230192-41

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

Identified uses : ☒ Analytical reagent.

☒ pUC 18 DNA Control Plasmid 0.01 ml (0.1 ng / µl)
☒ XL10-Gold 2-Mercaptoethanol 0.05 ml
☒ ArcticExpress (DE3) competent cells 1 ml (10 x 0.1ml)

Supplier/Manufacturer : Agilent Technologies Australia Pty Ltd
 679 Springvale Road
 Mulgrave
 Victoria 3170, Australia
 1800 802 402

Emergency telephone number (with hours of operation) : CHEMTREC®: +(61)-290372994

Section 2. Hazard(s) identification

Classification of the substance or mixture

☒ XL10-Gold

2-Mercaptoethanol

H318 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1
 H317 SKIN SENSITISATION - Category 1
 H361 REPRODUCTIVE TOXICITY - Category 2
 H412 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3

ArcticExpress (DE3)

competent cells

H320 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2B

☒ ArcticExpress (DE3) competent cells Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment: 5%

GHS label elements

Hazard pictograms

: XL10-Gold
 2-Mercaptoethanol



Signal word

: ☒ pUC 18 DNA Control Plasmid No signal word.
☒ XL10-Gold DANGER
☒ 2-Mercaptoethanol
☒ ArcticExpress (DE3) WARNING
☒ competent cells

Section 2. Hazard(s) identification

Hazard statements	: pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	No known significant effects or critical hazards. H317 - May cause an allergic skin reaction. H318 - Causes serious eye damage. H361 - Suspected of damaging fertility or the unborn child. H412 - Harmful to aquatic life with long lasting effects. H320 - Causes eye irritation.
	ArcticExpress (DE3) competent cells	

Precautionary statements

Prevention	: pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	Not applicable. P201 - Obtain special instructions before use. P280 - Wear protective gloves, protective clothing and eye or face protection. P273 - Avoid release to the environment.
	ArcticExpress (DE3) competent cells	Not applicable.
Response	: pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol	Not applicable. 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 doctor.
	ArcticExpress (DE3) 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. P337 + P313 - If eye irritation persists: Get medical advice or attention.

Storage	: pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol ArcticExpress (DE3) competent cells	Not applicable. Not applicable. Not applicable.
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Disposal	: pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol ArcticExpress (DE3) competent cells	Not applicable. P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations. Not applicable.
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Supplemental label elements

Additional warning phrases	: pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol ArcticExpress (DE3) competent cells	Not applicable. Not applicable. Not applicable.
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Other hazards which do not result in classification	: pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol ArcticExpress (DE3) competent cells	None known. None known. None known.
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Section 3. Composition and ingredient information

Substance/mixture : pUC 18 DNA Control Plasmid Mixture
 XL10-Gold Mixture
 2-Mercaptoethanol
 ArcticExpress (DE3) Mixture
 competent cells

CAS number/other identifiers

Ingredient name	% (w/w)	CAS number
XL10-Gold 2-Mercaptoethanol		
2-Mercaptoethanol	≤5	60-24-2
ArcticExpress (DE3) competent cells		
Glycerol	≥10 - ≤30	56-81-5
Dimethyl sulfoxide	≤10	67-68-5
Sucrose	≤10	57-50-1

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified and hence require reporting in this section.

The total concentration of ingredients in this product, reported or not in this section, is 100%.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : 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 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.
 2-Mercaptoethanol
 ArcticExpress (DE3) 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.

Inhalation : 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 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

Section 4. First aid measures

airway. Loosen tight clothing such as a collar, tie, belt or waistband.

ArcticExpress (DE3)
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.

Skin contact

: pUC 18 DNA Control Plasmid

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. 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.

XL10-Gold
2-Mercaptoethanol

ArcticExpress (DE3)
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.

Ingestion

: pUC 18 DNA Control Plasmid

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

XL10-Gold
2-Mercaptoethanol

ArcticExpress (DE3)
competent cells

Wash out mouth with water. Remove dentures if any. 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,

Section 4. First aid measures

belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact	: pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol ArcticExpress (DE3) competent cells	No known significant effects or critical hazards. Causes serious eye damage. Causes eye irritation.
Inhalation	: pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol ArcticExpress (DE3) competent cells	No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
Skin contact	: pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol ArcticExpress (DE3) competent cells	No known significant effects or critical hazards. May cause an allergic skin reaction. No known significant effects or critical hazards.
Ingestion	: pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol ArcticExpress (DE3) competent cells	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	: pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol ArcticExpress (DE3) competent cells	No specific data. Adverse symptoms may include the following: pain watering redness Adverse symptoms may include the following: irritation watering redness
Inhalation	: pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol ArcticExpress (DE3) competent cells	No specific data. Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations No specific data.
Skin contact	: pUC 18 DNA Control Plasmid XL10-Gold 2-Mercaptoethanol ArcticExpress (DE3) competent cells	No specific data. Adverse symptoms may include the following: pain or irritation redness blistering may occur reduced foetal weight increase in foetal deaths skeletal malformations No specific data.

Section 4. First aid measures

Ingestion	: pUC 18 DNA Control Plasmid	No specific data.
	XL10-Gold	Adverse symptoms may include the following:
	2-Mercaptoethanol	stomach pains reduced foetal weight increase in foetal deaths skeletal malformations
	ArcticExpress (DE3) competent cells	No specific data.

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

Notes to physician	: pUC 18 DNA Control Plasmid	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
	XL10-Gold	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
	2-Mercaptoethanol	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
	ArcticExpress (DE3) competent cells	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments	: pUC 18 DNA Control Plasmid	No specific treatment.
	XL10-Gold	No specific treatment.
	2-Mercaptoethanol	No specific treatment.
	ArcticExpress (DE3) competent cells	No specific treatment.
Protection of first-aiders	: pUC 18 DNA Control Plasmid	No action shall be taken involving any personal risk or without suitable training.
	XL10-Gold	No action shall be taken involving any personal risk or without suitable training. 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.
	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.
	ArcticExpress (DE3) 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.

See toxicological information (Section 11)

Section 5. Firefighting measures

Extinguishing media

Suitable extinguishing media	: pUC 18 DNA Control Plasmid	Use an extinguishing agent suitable for the surrounding fire.
	XL10-Gold	Use an extinguishing agent suitable for the surrounding fire.
	2-Mercaptoethanol	Use an extinguishing agent suitable for the surrounding fire.
	ArcticExpress (DE3) competent cells	Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media	: pUC 18 DNA Control Plasmid	None known.
	XL10-Gold	None known.
	2-Mercaptoethanol	None known.
	ArcticExpress (DE3) competent cells	None known.

Section 5. Firefighting measures

Specific hazards arising from the chemical	: 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. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
	ArcticExpress (DE3) competent cells	In a fire or if heated, a pressure increase will occur and the container may burst.
Hazardous thermal decomposition products	: pUC 18 DNA Control Plasmid	No specific data.
	XL10-Gold 2-Mercaptoethanol	Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides halogenated compounds metal oxide/oxides
	ArcticExpress (DE3) competent cells	Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides halogenated compounds metal oxide/oxides
Special protective actions for fire-fighters	: 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.
	ArcticExpress (DE3) 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.
Special protective equipment for fire-fighters	: 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.
	ArcticExpress (DE3) 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.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	: pUC 18 DNA Control Plasmid	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Put on appropriate personal protective equipment.
	XL10-Gold 2-Mercaptoethanol	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding

Section 6. Accidental release measures

ArcticExpress (DE3)
competent cells

areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : pUC 18 DNA Control Plasmid

If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel". If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel". If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

XL10-Gold
2-Mercaptoethanol

ArcticExpress (DE3)
competent cells

Environmental precautions : pUC 18 DNA Control Plasmid

Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

XL10-Gold
2-Mercaptoethanol

ArcticExpress (DE3)
competent cells

Methods and material for containment and cleaning up

Methods for cleaning up : 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.

ArcticExpress (DE3)
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.

Section 6. Accidental release measures

disposal contractor.

Section 7. Handling and storage

Precautions for safe handling

Protective measures

- : pUC 18 DNA Control Plasmid Put on appropriate personal protective equipment (see Section 8).
 XL10-Gold 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. Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
 2-Mercaptoethanol
 ArcticExpress (DE3) competent cells Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour 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.

Advice on general occupational hygiene

- : 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 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.
 2-Mercaptoethanol
 ArcticExpress (DE3) 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.

Conditions for safe storage, including any incompatibilities

- : 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

Section 7. Handling and storage

XL10-Gold
2-Mercaptoethanol


ArcticExpress (DE3)
competent cells

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

Section 8. Exposure controls and personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
 ArcticExpress (DE3) competent cells Glycerol Dimethyl sulfoxide Sucrose	Safe Work Australia (Australia, 10/2022). TWA: 10 mg/m ³ 8 hours. DFG MAC-values list (Germany, 7/2022). Absorbed through skin. PEAK: 320 mg/m ³ , 4 times per shift, 15 minutes. TWA: 160 mg/m ³ 8 hours. PEAK: 100 ppm, 4 times per shift, 15 minutes. TWA: 50 ppm 8 hours. Safe Work Australia (Australia, 10/2022). TWA: 10 mg/m ³ 8 hours.

Biological exposure indices

No exposure indices known.

Appropriate engineering controls

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

Environmental exposure controls

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

Individual protection measures

Section 8. Exposure controls and personal protection

- 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 and safety characteristics

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

Appearance


- Physical state** : pUC 18 DNA Control Plasmid Liquid.
XL10-Gold Liquid.
2-Mercaptoethanol
ArcticExpress (DE3) competent cells Liquid.
- Colour** : pUC 18 DNA Control Plasmid Not available.
XL10-Gold Not available.
2-Mercaptoethanol
ArcticExpress (DE3) competent cells Not available.
- Odour** : pUC 18 DNA Control Plasmid Not available.
XL10-Gold Not available.
2-Mercaptoethanol
ArcticExpress (DE3) competent cells Not available.
- Odour threshold** : pUC 18 DNA Control Plasmid Not available.
XL10-Gold Not available.
2-Mercaptoethanol
ArcticExpress (DE3) competent cells Not available.

Section 9. Physical and chemical properties and safety characteristics

pH : pUC 18 DNA Control Plasmid 7.5
 XL10-Gold Not available.
 2-Mercaptoethanol
 ArcticExpress (DE3) 6.4
 competent cells

Melting point/freezing point : pUC 18 DNA Control Plasmid 0°C (32°F)
 XL10-Gold Not available.
 2-Mercaptoethanol
 ArcticExpress (DE3) Not available.
 competent cells


Boiling point, initial boiling point, and boiling range : pUC 18 DNA Control Plasmid 100°C (212°F)
 XL10-Gold Not available.
 2-Mercaptoethanol
 ArcticExpress (DE3) Not available.
 competent cells

Flash point	Ingredient name	Closed cup			Open cup		
		°C	°F	Method	°C	°F	Method
	 XL10-Gold						
	2-Mercaptoethanol						
	2-Mercaptoethanol	74	165.2		74	165.2	
	ArcticExpress (DE3) competent cells						
	Dimethyl sulfoxide	87	188.6	ASTM D 93	87	188.6	
	Glycerol				177	350.6	

Evaporation rate : pUC 18 DNA Control Plasmid Not available.
 XL10-Gold Not available.
 2-Mercaptoethanol
 ArcticExpress (DE3) Not available.
 competent cells

Flammability : pUC 18 DNA Control Plasmid Not applicable.
 XL10-Gold Not applicable.
 2-Mercaptoethanol
 ArcticExpress (DE3) Not applicable.
 competent cells

Lower and upper explosion limit/flammability limit : pUC 18 DNA Control Plasmid Not available.
 XL10-Gold Not available.
 2-Mercaptoethanol
 ArcticExpress (DE3) Not available.
 competent cells

Vapour pressure	Ingredient name	Vapour Pressure at 20°C			Vapour pressure at 50°C		
		mm Hg	kPa	Method	mm Hg	kPa	Method
	 pUC 18 DNA Control Plasmid						
	water	17.5	2.3		92.258	12.3	
	XL10-Gold						
	2-Mercaptoethanol						
	water	17.5	2.3		92.258	12.3	

Section 9. Physical and chemical properties and safety characteristics

	2-Mercaptoethanol	0.98	0.13																																
	ArcticExpress (DE3) competent cells																																		
	water	17.5	2.3		92.258	12.3																													
	Dimethyl sulfoxide	0.42	0.056	EU A.4																															
Relative vapour density	: pUC 18 DNA Control Plasmid Not available. XL10-Gold Not available. 2-Mercaptoethanol ArcticExpress (DE3) competent cells Not available.																																		
Relative density	: pUC 18 DNA Control Plasmid Not available. XL10-Gold Not available. 2-Mercaptoethanol ArcticExpress (DE3) competent cells Not available.																																		
Solubility(ies)	: <table><tr><th>Media</th><th>Result</th></tr><tr><td>pUC 18 DNA Control Plasmid</td><td></td></tr><tr><td>water</td><td>Soluble</td></tr><tr><td>XL10-Gold</td><td></td></tr><tr><td>2-Mercaptoethanol</td><td></td></tr><tr><td>water</td><td>Soluble</td></tr><tr><td>ArcticExpress (DE3) competent cells</td><td></td></tr><tr><td>water</td><td>Soluble</td></tr></table>							Media	Result	pUC 18 DNA Control Plasmid		water	Soluble	XL10-Gold		2-Mercaptoethanol		water	Soluble	ArcticExpress (DE3) competent cells		water	Soluble												
Media	Result																																		
pUC 18 DNA Control Plasmid																																			
water	Soluble																																		
XL10-Gold																																			
2-Mercaptoethanol																																			
water	Soluble																																		
ArcticExpress (DE3) competent cells																																			
water	Soluble																																		
Partition coefficient: n-octanol/water	: <table><tr><td>pUC 18 DNA Control Plasmid</td><td>Not applicable.</td></tr><tr><td>XL10-Gold</td><td>Not applicable.</td></tr><tr><td>2-Mercaptoethanol</td><td></td></tr><tr><td>ArcticExpress (DE3) competent cells</td><td>Not applicable.</td></tr></table>							pUC 18 DNA Control Plasmid	Not applicable.	XL10-Gold	Not applicable.	2-Mercaptoethanol		ArcticExpress (DE3) competent cells	Not applicable.																				
pUC 18 DNA Control Plasmid	Not applicable.																																		
XL10-Gold	Not applicable.																																		
2-Mercaptoethanol																																			
ArcticExpress (DE3) competent cells	Not applicable.																																		
Auto-ignition temperature	: <table><tr><th>Ingredient name</th><th>°C</th><th>°F</th><th>Method</th></tr><tr><td>XL10-Gold</td><td></td><td></td><td></td></tr><tr><td>2-Mercaptoethanol</td><td></td><td></td><td></td></tr><tr><td>2-Mercaptoethanol</td><td>295</td><td>563</td><td></td></tr><tr><td>ArcticExpress (DE3) competent cells</td><td></td><td></td><td></td></tr><tr><td>Dimethyl sulfoxide</td><td>300 to 302</td><td>572 to 575.6</td><td></td></tr><tr><td>Glycerol</td><td>370</td><td>698</td><td></td></tr></table>							Ingredient name	°C	°F	Method	XL10-Gold				2-Mercaptoethanol				2-Mercaptoethanol	295	563		ArcticExpress (DE3) competent cells				Dimethyl sulfoxide	300 to 302	572 to 575.6		Glycerol	370	698	
Ingredient name	°C	°F	Method																																
XL10-Gold																																			
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ArcticExpress (DE3) competent cells																																			
Dimethyl sulfoxide	300 to 302	572 to 575.6																																	
Glycerol	370	698																																	
Decomposition temperature	: pUC 18 DNA Control Plasmid Not available. XL10-Gold Not available. 2-Mercaptoethanol ArcticExpress (DE3) competent cells Not available.																																		
Viscosity	: pUC 18 DNA Control Plasmid Not available. XL10-Gold Not available. 2-Mercaptoethanol ArcticExpress (DE3) competent cells Not available.																																		

Section 9. Physical and chemical properties and safety characteristics

Particle characteristics

Median particle size	:	pUC 18 DNA Control Plasmid	Not applicable.
		XL10-Gold	Not applicable.
		2-Mercaptoethanol	
		ArcticExpress (DE3) competent cells	Not applicable.

Section 10. Stability and reactivity

Reactivity	:	pUC 18 DNA Control Plasmid	No specific test data related to reactivity available for this product or its ingredients.
		XL10-Gold	No specific test data related to reactivity available for this product or its ingredients.
		2-Mercaptoethanol	No specific test data related to reactivity available for this product or its ingredients.
		ArcticExpress (DE3) competent cells	No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	:	pUC 18 DNA Control Plasmid	The product is stable.
		XL10-Gold	The product is stable.
		2-Mercaptoethanol	
		ArcticExpress (DE3) competent cells	The product is stable.
Possibility of hazardous reactions	:	pUC 18 DNA Control Plasmid	Under normal conditions of storage and use, hazardous reactions will not occur.
		XL10-Gold	Under normal conditions of storage and use, hazardous reactions will not occur.
		2-Mercaptoethanol	Under normal conditions of storage and use, hazardous reactions will not occur.
		ArcticExpress (DE3) competent cells	Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	:	pUC 18 DNA Control Plasmid	No specific data.
		XL10-Gold	No specific data.
		2-Mercaptoethanol	
		ArcticExpress (DE3) competent cells	No specific data.
Incompatible materials	:	pUC 18 DNA Control Plasmid	May react or be incompatible with oxidising materials.
		XL10-Gold	May react or be incompatible with oxidising materials.
		2-Mercaptoethanol	
		ArcticExpress (DE3) competent cells	May react or be incompatible with oxidising materials.
Hazardous decomposition products	:	pUC 18 DNA Control Plasmid	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
		XL10-Gold	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
		2-Mercaptoethanol	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
		ArcticExpress (DE3) competent cells	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Section 11. Toxicological information

Product/ingredient name	Result	Species	Dose	Exposure
XL10-Gold 2-Mercaptoethanol 2-Mercaptoethanol	LD50 Oral	Rat	244 mg/kg	-
ArcticExpress (DE3) competent cells Glycerol	LD50 Oral	Rat	12600 mg/kg	-
Dimethyl sulfoxide	LD50 Dermal	Rat	40000 mg/kg	-
	LD50 Oral	Rat	14500 mg/kg	-
Sucrose	LD50 Oral	Rat	29700 mg/kg	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
XL10-Gold 2-Mercaptoethanol 2-Mercaptoethanol	Eyes - Severe irritant	Rabbit	-	2 mg	-
ArcticExpress (DE3) competent cells Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
Dimethyl sulfoxide	Eyes - Mild irritant	Rabbit	-	100 mg	-
	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Skin - Mild irritant	Rabbit	-	100 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-

Sensitisation

Not available.

Mutagenicity

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
XL10-Gold 2-Mercaptoethanol 2-Mercaptoethanol	Category 3	-	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
XL10-Gold 2-Mercaptoethanol 2-Mercaptoethanol	Category 2	oral	heart, liver

Aspiration hazard

Not available.

Section 11. Toxicological information

Information on likely routes of exposure : ☒ pUC 18 DNA Control Plasmid Not available.
 XL10-Gold Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
 2-Mercaptoethanol Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
 ArcticExpress (DE3) competent cells

Potential acute health effects

Eye contact : ☒ pUC 18 DNA Control Plasmid No known significant effects or critical hazards.
 XL10-Gold Causes serious eye damage.
 2-Mercaptoethanol Causes eye irritation.
 ArcticExpress (DE3) competent cells

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

Skin contact : pUC 18 DNA Control Plasmid No known significant effects or critical hazards.
 XL10-Gold May cause an allergic skin reaction.
 2-Mercaptoethanol No known significant effects or critical hazards.
 ArcticExpress (DE3) competent cells

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

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : ☒ pUC 18 DNA Control Plasmid No specific data.
 XL10-Gold Adverse symptoms may include the following:
 2-Mercaptoethanol pain
 watering
 redness
 ArcticExpress (DE3) competent cells Adverse symptoms may include the following:
 irritation
 watering
 redness

Inhalation : pUC 18 DNA Control Plasmid No specific data.
 XL10-Gold Adverse symptoms may include the following:
 2-Mercaptoethanol reduced foetal weight
 increase in foetal deaths
 skeletal malformations
 ArcticExpress (DE3) competent cells No specific data.

Skin contact : pUC 18 DNA Control Plasmid No specific data.
 XL10-Gold Adverse symptoms may include the following:
 2-Mercaptoethanol pain or irritation
 redness
 blistering may occur
 reduced foetal weight
 increase in foetal deaths
 skeletal malformations
 ArcticExpress (DE3) competent cells No specific data.

Section 11. Toxicological information

Ingestion	: pUC 18 DNA Control Plasmid	No specific data.
	XL10-Gold	Adverse symptoms may include the following:
	2-Mercaptoethanol	stomach pains reduced foetal weight increase in foetal deaths skeletal malformations
	ArcticExpress (DE3) competent cells	No specific data.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

General	: pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
	XL10-Gold	Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
	2-Mercaptoethanol	No known significant effects or critical hazards.
	ArcticExpress (DE3) competent cells	
Carcinogenicity	: pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
	XL10-Gold	No known significant effects or critical hazards.
	2-Mercaptoethanol	
	ArcticExpress (DE3) competent cells	No known significant effects or critical hazards.
Mutagenicity	: pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
	XL10-Gold	No known significant effects or critical hazards.
	2-Mercaptoethanol	
	ArcticExpress (DE3) competent cells	No known significant effects or critical hazards.
Reproductive toxicity	: pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
	XL10-Gold	Suspected of damaging fertility or the unborn child.
	2-Mercaptoethanol	
	ArcticExpress (DE3) competent cells	No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapours) (mg/l)	Inhalation (dusts and mists) (mg/l)
XL10-Gold 2-Mercaptoethanol					
XL10-Gold 2-Mercaptoethanol	5545.5	4545.5	N/A	60.7	N/A
2-Mercaptoethanol	244	200	N/A	3	N/A
ArcticExpress (DE3) competent cells					
Glycerol	12600	N/A	N/A	N/A	N/A
Dimethyl sulfoxide	14500	40000	N/A	N/A	N/A
Sucrose	29700	N/A	N/A	N/A	N/A

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
ArcticExpress (DE3) competent cells Glycerol Dimethyl sulfoxide	Acute LC50 54000 mg/l Fresh water Acute LC50 25000 ppm Fresh water Acute LC50 34000000 µg/l Fresh water Chronic NOEC 100 µl/L Marine water Chronic NOEC 100 µl/L Fresh water	Fish - Oncorhynchus mykiss Daphnia - Daphnia magna - Neonate Fish - Pimephales promelas Algae - Ulva lactuca Daphnia - Daphnia magna - Juvenile (Fledgling, Hatchling, Weanling)	96 hours 48 hours 96 hours 72 hours 21 days

Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
XL10-Gold 2-Mercaptoethanol 2-Mercaptoethanol	OECD 310 Ready Biodegradability - CO2 in Sealed Vessels (Headspace Test)	69 % - Not readily - 60 days	20 mg/l	-
ArcticExpress (DE3) competent cells Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-
Dimethyl sulfoxide	OECD 301D Ready Biodegradability - Closed Bottle Test	31 % - Not readily - 28 days	-	-

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
XL10-Gold 2-Mercaptoethanol 2-Mercaptoethanol	-	-	Not readily
ArcticExpress (DE3) competent cells Dimethyl sulfoxide	-	-	Not readily

Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
XL10-Gold 2-Mercaptoethanol 2-Mercaptoethanol	-0.056	-	low
ArcticExpress (DE3) competent cells Glycerol	-1.76	-	low
Dimethyl sulfoxide	-1.35	3.16	low
Sucrose	-3.7	-	low

Section 12. Ecological information

Mobility in soil

Soil/water partition coefficient (K_{oc}) : Not available.

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

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

ADG / IMDG / IATA : Not regulated as Dangerous Goods according to the ADG Code .

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to IMO instruments : Not available.

Section 15. Regulatory information

Standard for the Uniform Scheduling of Medicines and Poisons

6

Model Work Health and Safety Regulations - Scheduled Substances

No listed substance

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals



Not listed.

Inventory list

Australia : All components are listed or exempted.

Canada : All components are listed or exempted.

Section 15. Regulatory information

China	: Not determined.
Eurasian Economic Union	:  Russian Federation inventory : All components are listed or exempted.
Japan	: Japan inventory (CSCL) : Not determined. Japan inventory (ISHL) : All components are listed or exempted.
New Zealand	: Not determined.
Philippines	: Not determined.
Republic of Korea	: All components are listed or exempted.
Taiwan	: All components are listed or exempted.
Thailand	: Not determined.
Turkey	: Not determined.
United States	: All components are active or exempted.
Viet Nam	:  All components are listed or exempted.

Section 16. Any other relevant information


History

Date of issue/Date of revision	: 03/06/2023
Date of previous issue	: 03/12/2020
Version	: 8

Key to abbreviations

: ADG = Australian Dangerous Goods
: ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road
: ATE = Acute Toxicity Estimate
: BCF = Bioconcentration Factor
: GHS = Globally Harmonized System of Classification and Labelling of Chemicals
: IATA = International Air Transport Association
: IBC = Intermediate Bulk Container
: IMDG = International Maritime Dangerous Goods
: LogPow = logarithm of the octanol/water partition coefficient
: MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
: N/A = Not available
: SUSMP = Standard Uniform Schedule of Medicine and Poisons
: UN = United Nations

Procedure used to derive the classification

Classification	Justification
 XL10-Gold 2-Mercaptoethanol SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1 SKIN SENSITISATION - Category 1 REPRODUCTIVE TOXICITY - Category 2 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3	Calculation method Calculation method Calculation method Calculation method
ArcticExpress (DE3) competent cells SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2B	Calculation method

 Indicates information that has changed from previously issued version.

Notice to reader

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