

SAFETY DATA SHEET



Protein Expression Competent Cell Pack, Part Number 230246

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name	: Protein Expression Competent Cell Pack, Part Number 230246
Part no. (chemical kit)	: 230246
Part no.	: <input checked="" type="checkbox"/> BL21(DE3) competent cells 200131-41
	BL21-Gold(DE3) Competent Cells 230132-41
	BL21-CodonPlus (DE3)-RIPL competent cells 230280-41
	BL21-Gold(DE3) pLysS Competent Cells 230134-41
	pUC 18 DNA Control Plasmid 200231-42
	Beta Mercaptoethanol 210200-43
	XL10-Gold 2-Mercaptoethanol 200314-43

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

Material uses	: Analytical reagent.
	<input checked="" type="checkbox"/> BL21(DE3) competent cells 0.2 ml
	BL21-Gold(DE3) Competent Cells 0.2 ml
	BL21-CodonPlus (DE3)-RIPL competent cells 0.2 ml
	BL21-Gold(DE3) pLysS Competent Cells 0.2 ml
	pUC 18 DNA Control Plasmid 0.04 ml (0.1 ng/μl)
	Beta Mercaptoethanol 0.025 ml 1.42M
	XL10-Gold 2-Mercaptoethanol 0.05 ml

1.3 Details of the supplier of the safety data sheet

Agilent Technologies Manufacturing GmbH & Co. KG
Hewlett-Packard-Str. 8
76337 Waldbronn
Germany
0800 603 1000

e-mail address of person responsible for this SDS : pdl-msds_author@agilent.com

1.4 Emergency telephone number

Emergency telephone number (with hours of operation) : CHEMTREC®: +(44)-870-8200418

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Protein Expression Competent Cell Pack, Part Number 230246

SECTION 2: Hazards identification

Product definition	:	BL21(DE3) competent cells	Mixture
		BL21-Gold(DE3) Competent Cells	Mixture
		BL21-CodonPlus (DE3)-RIPL competent cells	Mixture
		BL21-Gold(DE3) pLysS Competent Cells	Mixture
		pUC 18 DNA Control Plasmid	Mixture
		Beta Mercaptoethanol	Mixture
		XL10-Gold 2-Mercaptoethanol	Mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Beta Mercaptoethanol

H312	ACUTE TOXICITY (dermal) - Category 4
H332	ACUTE TOXICITY (inhalation) - Category 4
H315	SKIN CORROSION/IRRITATION - Category 2
H318	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1
H317	SKIN SENSITISATION - Category 1
H412	LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3

XL10-Gold 2-Mercaptoethanol

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

Ingredients of unknown toxicity

BL21(DE3) competent cells	Percentage of the mixture consisting of ingredient(s) of unknown dermal toxicity: 1 - 10%
	Percentage of the mixture consisting of ingredient(s) of unknown inhalation toxicity: 10 - 30%
BL21-Gold(DE3) Competent Cells	Percentage of the mixture consisting of ingredient(s) of unknown dermal toxicity: 1 - 10%
	Percentage of the mixture consisting of ingredient(s) of unknown inhalation toxicity: 10 - 30%
BL21-CodonPlus (DE3)-RIPL competent cells	Percentage of the mixture consisting of ingredient(s) of unknown dermal toxicity: 1 - 10%
	Percentage of the mixture consisting of ingredient(s) of unknown inhalation toxicity: 10 - 30%
BL21-Gold(DE3) pLysS Competent Cells	Percentage of the mixture consisting of ingredient(s) of unknown dermal toxicity: 1 - 10%
	Percentage of the mixture consisting of ingredient(s) of unknown inhalation toxicity: 10 - 30%
XL10-Gold 2-Mercaptoethanol	Percentage of the mixture consisting of ingredient(s) of unknown inhalation toxicity: 10 - 30%

See Section 16 for the full text of the H statements declared above.

See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements

Hazard pictograms

Beta Mercaptoethanol	
XL10-Gold 2-Mercaptoethanol	

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SECTION 2: Hazards identification

Signal word	: BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol XL10-Gold 2-Mercaptoethanol	No signal word. No signal word. No signal word. No signal word. No signal word. No signal word. Danger Danger
Hazard statements	: BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol 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. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. H312 + H332 - Harmful in contact with skin or if inhaled. H318 - Causes serious eye damage. H315 - Causes skin irritation. H317 - May cause an allergic skin reaction. H412 - Harmful to aquatic life with long lasting effects. H318 - Causes serious eye damage. H317 - May cause an allergic skin reaction. H412 - Harmful to aquatic life with long lasting effects.
<u>Precautionary statements</u>		
Prevention	: BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol XL10-Gold 2-Mercaptoethanol	Not applicable. Not applicable. Not applicable. Not applicable. Not applicable. Not applicable. P280 - Wear protective gloves. Wear protective clothing. Wear eye or face protection. P273 - Avoid release to the environment. P280 - Wear protective gloves. Wear eye or face protection. P273 - Avoid release to the environment.
Response	: BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not applicable. Not applicable. Not applicable. Not applicable. Not applicable. P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing.

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		P305 + P310 - IF IN EYES: Immediately call a POISON CENTER or physician.
	XL10-Gold	P305 + P351 + P310 - IF IN EYES: Rinse cautiously with water for several minutes. Immediately call a POISON CENTER or physician.
	2-Mercaptoethanol	Not applicable.
Storage	: BL21(DE3) competent cells	Not applicable.
	BL21-Gold(DE3) Competent Cells	Not applicable.
	BL21-CodonPlus (DE3)-RIPL competent cells	Not applicable.
	BL21-Gold(DE3) pLysS Competent Cells	Not applicable.
	pUC 18 DNA Control Plasmid	Not applicable.
	Beta Mercaptoethanol	Not applicable.
	XL10-Gold	Not applicable.
	2-Mercaptoethanol	Not applicable.
Disposal	: BL21(DE3) competent cells	Not applicable.
	BL21-Gold(DE3) Competent Cells	Not applicable.
	BL21-CodonPlus (DE3)-RIPL competent cells	Not applicable.
	BL21-Gold(DE3) pLysS Competent Cells	Not applicable.
	pUC 18 DNA Control Plasmid	Not applicable.
	Beta Mercaptoethanol	P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
	XL10-Gold	P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
	2-Mercaptoethanol	
Hazardous ingredients	: Beta Mercaptoethanol	- 2-Mercaptoethanol
	XL10-Gold	- 2-Mercaptoethanol
	2-Mercaptoethanol	
Supplemental label elements	: BL21(DE3) competent cells	Not applicable.
	BL21-Gold(DE3) Competent Cells	Not applicable.
	BL21-CodonPlus (DE3)-RIPL competent cells	Not applicable.
	BL21-Gold(DE3) pLysS Competent Cells	Not applicable.
	pUC 18 DNA Control Plasmid	Not applicable.
	Beta Mercaptoethanol	Not applicable.
	XL10-Gold	Not applicable.
	2-Mercaptoethanol	
Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles	: BL21(DE3) competent cells	Not applicable.
	BL21-Gold(DE3) Competent Cells	Not applicable.
	BL21-CodonPlus (DE3)-RIPL competent cells	Not applicable.
	BL21-Gold(DE3) pLysS Competent Cells	Not applicable.
	pUC 18 DNA Control Plasmid	Not applicable.
	Beta Mercaptoethanol	Not applicable.
	XL10-Gold	Not applicable.

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SECTION 2: Hazards identification

2-Mercaptoethanol

Special packaging requirements

Tactile warning of danger	:	BL21(DE3) competent cells	Not applicable.
		BL21-Gold(DE3) Competent Cells	Not applicable.
		BL21-CodonPlus (DE3)-RIPL competent cells	Not applicable.
		BL21-Gold(DE3) pLysS Competent Cells	Not applicable.
		pUC 18 DNA Control Plasmid	Not applicable.
		Beta Mercaptoethanol	Not applicable.
		XL10-Gold	Not applicable.
		2-Mercaptoethanol	

2.3 Other hazards

Other hazards which do not result in classification	:	BL21(DE3) competent cells	None known.
		BL21-Gold(DE3) Competent Cells	None known.
		BL21-CodonPlus (DE3)-RIPL competent cells	None known.
		BL21-Gold(DE3) pLysS Competent Cells	None known.
		pUC 18 DNA Control Plasmid	None known.
		Beta Mercaptoethanol	None known.
		XL10-Gold	None known.
		2-Mercaptoethanol	

SECTION 3: Composition/information on ingredients

3.1 Substances	:	BL21(DE3) competent cells	Mixture
		BL21-Gold(DE3) Competent Cells	Mixture
		BL21-CodonPlus (DE3)-RIPL competent cells	Mixture
		BL21-Gold(DE3) pLysS Competent Cells	Mixture
		pUC 18 DNA Control Plasmid	Mixture
		Beta Mercaptoethanol	Mixture
		XL10-Gold 2-Mercaptoethanol	Mixture

Product/ingredient name	Identifiers	%	Regulation (EC) No. 1272/2008 [CLP]	Type
BL21(DE3) competent cells				
Glycerol	REACH #: Annex V EC: 200-289-5 CAS: 56-81-5	≥10 - ≤25	Not classified.	[2]
Sucrose	REACH #: Annex IV EC: 200-334-9 CAS: 57-50-1	≤10	Not classified.	[2]
BL21-Gold(DE3) Competent Cells				
Glycerol	REACH #: Annex V EC: 200-289-5 CAS: 56-81-5	≥10 - ≤25	Not classified.	[2]
Sucrose	REACH #: Annex IV EC: 200-334-9 CAS: 57-50-1	≤10	Not classified.	[2]

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SECTION 3: Composition/information on ingredients

BL21-CodonPlus (DE3)-RIPL competent cells				
Glycerol	REACH #: Annex V EC: 200-289-5 CAS: 56-81-5	≥10 - ≤25	Not classified.	[2]
Sucrose	REACH #: Annex IV EC: 200-334-9 CAS: 57-50-1	≤10	Not classified.	[2]
BL21-Gold(DE3) pLysS Competent Cells				
Glycerol	REACH #: Annex V EC: 200-289-5 CAS: 56-81-5	≥10 - ≤25	Not classified.	[2]
Sucrose	REACH #: Annex IV EC: 200-334-9 CAS: 57-50-1	≤10	Not classified.	[2]
Beta Mercaptoethanol				
2-Mercaptoethanol	EC: 200-464-6 CAS: 60-24-2	≤12	Acute Tox. 3, H301 Acute Tox. 2, H310 Acute Tox. 2, H330 Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 STOT SE 3, H335 Aquatic Chronic 2, H411	[1]
XL10-Gold 2-Mercaptoethanol				
Sodium chloride	EC: 231-598-3 CAS: 7647-14-5	≥10 - ≤25	Eye Irrit. 2, H319	[1]
2-Mercaptoethanol	EC: 200-464-6 CAS: 60-24-2	≤5	Acute Tox. 3, H301 Acute Tox. 2, H310 Acute Tox. 2, H330 Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 STOT SE 3, H335 Aquatic Chronic 2, H411 See Section 16 for the full text of the H statements declared above.	[1]

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.

Type

- [1] Substance classified with a health or environmental hazard
- [2] Substance with a workplace exposure limit
- [3] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII
- [4] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII
- [5] Substance of equivalent concern
- [6] Additional disclosure due to company policy

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact

: BL21(DE3) competent cells

Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs. 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.

BL21-Gold(DE3)
Competent Cells

Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.

BL21-CodonPlus (DE3)-
RIPL competent cells

Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.

BL21-Gold(DE3) pLysS
Competent Cells

Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.

pUC 18 DNA Control
Plasmid

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.

Beta Mercaptoethanol

Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.

XL10-Gold
2-Mercaptoethanol

Inhalation

: BL21(DE3) competent cells

Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.

BL21-Gold(DE3)
Competent Cells

Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.

BL21-CodonPlus (DE3)-
RIPL competent cells

Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.

BL21-Gold(DE3) pLysS
Competent Cells

Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.

pUC 18 DNA Control
Plasmid

Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.

Beta Mercaptoethanol

Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

XL10-Gold
2-Mercaptoethanol

Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest

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		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	: BL21(DE3) competent cells	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	BL21-Gold(DE3) Competent Cells	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	BL21-CodonPlus (DE3)-RIPL competent cells	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	BL21-Gold(DE3) pLysS Competent Cells	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	pUC 18 DNA Control Plasmid	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
	Beta Mercaptoethanol	Get medical attention immediately. Call a poison center or physician. Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water 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	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	: BL21(DE3) competent cells	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
	BL21-Gold(DE3) Competent Cells	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
	BL21-CodonPlus (DE3)-RIPL competent cells	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
	BL21-Gold(DE3) pLysS Competent Cells	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not

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pUC 18 DNA Control Plasmid	induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur. 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.
Beta Mercaptoethanol	Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
XL10-Gold 2-Mercaptoethanol	Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Protection of first-aiders :	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol 	<p>No action shall be taken involving any personal risk or without suitable training.</p> <p>No action shall be taken involving any personal risk or without suitable training.</p> <p>No action shall be taken involving any personal risk or without suitable training.</p> <p>No action shall be taken involving any personal risk or without suitable training.</p> <p>No action shall be taken involving any personal risk or without suitable training.</p> <p>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.</p> <p>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.</p>
	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.

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4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

Eye contact	:	BL21(DE3) competent cells	No known significant effects or critical hazards.		
		BL21-Gold(DE3) Competent Cells	No known significant effects or critical hazards.		
		BL21-CodonPlus (DE3)-RIPL competent cells	No known significant effects or critical hazards.		
		BL21-Gold(DE3) pLysS Competent Cells	No known significant effects or critical hazards.		
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.		
		Beta Mercaptoethanol	Causes serious eye damage.		
		XL10-Gold	Causes serious eye damage.		
		2-Mercaptoethanol			
		Inhalation	:	BL21(DE3) competent cells	No known significant effects or critical hazards.
				BL21-Gold(DE3) Competent Cells	No known significant effects or critical hazards.
BL21-CodonPlus (DE3)-RIPL competent cells	No known significant effects or critical hazards.				
BL21-Gold(DE3) pLysS Competent Cells	No known significant effects or critical hazards.				
pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.				
Beta Mercaptoethanol	Harmful if inhaled.				
XL10-Gold	No known significant effects or critical hazards.				
2-Mercaptoethanol					
Skin contact	:			BL21(DE3) competent cells	No known significant effects or critical hazards.
				BL21-Gold(DE3) Competent Cells	No known significant effects or critical hazards.
		BL21-CodonPlus (DE3)-RIPL competent cells	No known significant effects or critical hazards.		
		BL21-Gold(DE3) pLysS Competent Cells	No known significant effects or critical hazards.		
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.		
		Beta Mercaptoethanol	Harmful in contact with skin. Causes skin irritation. May cause an allergic skin reaction.		
		XL10-Gold	May cause an allergic skin reaction.		
		2-Mercaptoethanol			
		Ingestion	:	BL21(DE3) competent cells	No known significant effects or critical hazards.
				BL21-Gold(DE3) Competent Cells	No known significant effects or critical hazards.
BL21-CodonPlus (DE3)-RIPL competent cells	No known significant effects or critical hazards.				
BL21-Gold(DE3) pLysS Competent Cells	No known significant effects or critical hazards.				
pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.				
Beta Mercaptoethanol	No known significant effects or critical hazards.				
XL10-Gold	No known significant effects or critical hazards.				
2-Mercaptoethanol					

Over-exposure signs/symptoms

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Eye contact	:	BL21(DE3) competent cells	No specific data.
		BL21-Gold(DE3) Competent Cells	No specific data.
		BL21-CodonPlus (DE3)-RIPL competent cells	No specific data.
		BL21-Gold(DE3) pLysS Competent Cells	No specific data.
		pUC 18 DNA Control Plasmid	No specific data.
		Beta Mercaptoethanol	Adverse symptoms may include the following: pain watering redness
		XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following: pain watering redness
Inhalation	:	BL21(DE3) competent cells	No specific data.
		BL21-Gold(DE3) Competent Cells	No specific data.
		BL21-CodonPlus (DE3)-RIPL competent cells	No specific data.
		BL21-Gold(DE3) pLysS Competent Cells	No specific data.
		pUC 18 DNA Control Plasmid	No specific data.
		Beta Mercaptoethanol	No specific data.
		XL10-Gold 2-Mercaptoethanol	No specific data.
Skin contact	:	BL21(DE3) competent cells	No specific data.
		BL21-Gold(DE3) Competent Cells	No specific data.
		BL21-CodonPlus (DE3)-RIPL competent cells	No specific data.
		BL21-Gold(DE3) pLysS Competent Cells	No specific data.
		pUC 18 DNA Control Plasmid	No specific data.
		Beta Mercaptoethanol	Adverse symptoms may include the following: pain or irritation redness blistering may occur
		XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following: pain or irritation redness blistering may occur
Ingestion	:	BL21(DE3) competent cells	No specific data.
		BL21-Gold(DE3) Competent Cells	No specific data.
		BL21-CodonPlus (DE3)-RIPL competent cells	No specific data.
		BL21-Gold(DE3) pLysS Competent Cells	No specific data.
		pUC 18 DNA Control Plasmid	No specific data.

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Beta Mercaptoethanol	Adverse symptoms may include the following: stomach pains
XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following: stomach pains

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician	: BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments	: XL10-Gold 2-Mercaptoethanol BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol XL10-Gold 2-Mercaptoethanol	No specific treatment. No specific treatment. No specific treatment. No specific treatment. No specific treatment. No specific treatment. No specific treatment. No specific treatment. No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	: BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol XL10-Gold 2-Mercaptoethanol	Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media	: BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid	None known. None known. None known. None known. None known.

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SECTION 5: Firefighting measures

Beta Mercaptoethanol None known.
 XL10-Gold None known.
 2-Mercaptoethanol

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture	: <input checked="" type="checkbox"/> BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol XL10-Gold 2-Mercaptoethanol	In a fire or if heated, a pressure increase will occur and the container may burst. In a fire or if heated, a pressure increase will occur and the container may burst. In a fire or if heated, a pressure increase will occur and the container may burst. In a fire or if heated, a pressure increase will occur and the container may burst. In a fire or if heated, a pressure increase will occur and the container may burst. In a fire or if heated, a pressure increase will occur and the container may burst. 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. 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.
Hazardous combustion products	: <input checked="" type="checkbox"/> BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol XL10-Gold	Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides halogenated compounds metal oxide/oxides Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides halogenated compounds metal oxide/oxides Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides halogenated compounds metal oxide/oxides Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides halogenated compounds metal oxide/oxides No specific data. Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides Decomposition products may include the following materials:

SECTION 5: Firefighting measures

2-Mercaptoethanol

carbon dioxide
carbon monoxide
sulfur oxides
halogenated compounds
metal oxide/oxides

5.3 Advice for firefighters

Special precautions for fire-fighters

: BL21(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.
BL21-Gold(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.
BL21-CodonPlus (DE3)-RIPL 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.
BL21-Gold(DE3) pLysS 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.
Beta 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.
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

: BL21(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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
BL21-Gold(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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
BL21-CodonPlus (DE3)-RIPL 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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
BL21-Gold(DE3) pLysS 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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
Beta Mercaptoethanol	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full

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SECTION 5: Firefighting measures

XL10-Gold
2-Mercaptoethanol

face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

: BL21(DE3) competent cells

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Put on appropriate personal protective equipment.

BL21-Gold(DE3)
Competent Cells

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Put on appropriate personal protective equipment.

BL21-CodonPlus (DE3)-
RIPL competent cells

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Put on appropriate personal protective equipment.

BL21-Gold(DE3) pLysS
Competent Cells

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Put on appropriate personal protective equipment.

pUC 18 DNA Control
Plasmid

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Put on appropriate personal protective equipment.

Beta Mercaptoethanol

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

XL10-Gold
2-Mercaptoethanol

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

For emergency responders

: BL21(DE3) competent cells

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

BL21-Gold(DE3)
Competent Cells

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

BL21-CodonPlus (DE3)-

If specialised clothing is required to deal with the spillage,

SECTION 6: Accidental release measures

RIPL competent cells	take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
BL21-Gold(DE3) pLysS Competent Cells	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
pUC 18 DNA Control Plasmid	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Beta Mercaptoethanol	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
XL10-Gold 2-Mercaptoethanol	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

6.2 Environmental precautions

: BL21(DE3) competent cells	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
BL21-Gold(DE3) Competent Cells	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
BL21-CodonPlus (DE3)-RIPL competent cells	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
BL21-Gold(DE3) pLysS Competent Cells	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
pUC 18 DNA Control Plasmid	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
Beta Mercaptoethanol	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.
XL10-Gold 2-Mercaptoethanol	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

6.3 Methods and material for containment and cleaning up

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SECTION 6: Accidental release measures

Methods for cleaning up	: BL21(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.
	BL21-Gold(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.
	BL21-CodonPlus (DE3)-RIPL 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.
	BL21-Gold(DE3) pLysS Competent Cells	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
	pUC 18 DNA Control Plasmid	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
	Beta Mercaptoethanol	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
	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.

6.4 Reference to other sections : See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Protective measures	: BL21(DE3) competent cells	Put on appropriate personal protective equipment (see Section 8).
	BL21-Gold(DE3) Competent Cells	Put on appropriate personal protective equipment (see Section 8).
	BL21-CodonPlus (DE3)-RIPL competent cells	Put on appropriate personal protective equipment (see Section 8).
	BL21-Gold(DE3) pLysS Competent Cells	Put on appropriate personal protective equipment (see Section 8).
	pUC 18 DNA Control Plasmid	Put on appropriate personal protective equipment (see Section 8).
	Beta 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 vapour or mist. Do not ingest. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly

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SECTION 7: Handling and storage

Advice on general occupational hygiene

<p>XL10-Gold 2-Mercaptoethanol</p>	<p>closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container. Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.</p>
<p>: BL21(DE3) competent cells</p>	<p>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.</p>
<p>BL21-Gold(DE3) Competent Cells</p>	<p>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.</p>
<p>BL21-CodonPlus (DE3)-RIPL competent cells</p>	<p>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.</p>
<p>BL21-Gold(DE3) pLysS Competent Cells</p>	<p>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.</p>
<p>pUC 18 DNA Control Plasmid</p>	<p>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.</p>
<p>Beta Mercaptoethanol</p>	<p>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.</p>
<p>XL10-Gold 2-Mercaptoethanol</p>	<p>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.</p>

SECTION 7: Handling and storage

7.2 Conditions for safe storage, including any incompatibilities

Storage	:	BL21(DE3) 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 unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
		BL21-Gold(DE3) 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 unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
		BL21-CodonPlus (DE3)-RIPL 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 unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
		BL21-Gold(DE3) pLysS 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 unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
		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 unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
		Beta 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 unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

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SECTION 7: Handling and storage

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 unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
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7.3 Specific end use(s)

Recommendations	: <input checked="" type="checkbox"/> BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol XL10-Gold 2-Mercaptoethanol	Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications. Industrial applications, Professional applications.
Industrial sector specific solutions	: <input checked="" type="checkbox"/> BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol XL10-Gold 2-Mercaptoethanol	Not applicable. Not applicable. Not applicable. Not applicable. Not applicable. Not applicable. Not applicable. Not applicable.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
<input checked="" type="checkbox"/> BL21(DE3) competent cells Glycerol Sucrose	EH40/2005 WELs (United Kingdom (UK), 12/2011). TWA: 10 mg/m ³ 8 hours. Form: Mist EH40/2005 WELs (United Kingdom (UK), 12/2011). STEL: 20 mg/m ³ 15 minutes. TWA: 10 mg/m ³ 8 hours.
BL21-Gold(DE3) Competent Cells Glycerol Sucrose	EH40/2005 WELs (United Kingdom (UK), 12/2011). TWA: 10 mg/m ³ 8 hours. Form: Mist EH40/2005 WELs (United Kingdom (UK), 12/2011). STEL: 20 mg/m ³ 15 minutes. TWA: 10 mg/m ³ 8 hours.
BL21-CodonPlus (DE3)-RIPL competent cells	

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SECTION 8: Exposure controls/personal protection

Glycerol	EH40/2005 WELs (United Kingdom (UK), 12/2011). TWA: 10 mg/m ³ 8 hours. Form: Mist
Sucrose	EH40/2005 WELs (United Kingdom (UK), 12/2011). STEL: 20 mg/m ³ 15 minutes. TWA: 10 mg/m ³ 8 hours.
BL21-Gold(DE3) pLysS Competent Cells	
Glycerol	EH40/2005 WELs (United Kingdom (UK), 12/2011). TWA: 10 mg/m ³ 8 hours. Form: Mist
Sucrose	EH40/2005 WELs (United Kingdom (UK), 12/2011). STEL: 20 mg/m ³ 15 minutes. TWA: 10 mg/m ³ 8 hours.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs

No DNELs/DMELs available.

PNECs

No PNECs available

8.2 Exposure controls

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.

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.

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SECTION 8: Exposure controls/personal protection

- 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.
- 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.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

- Physical state** : BL21(DE3) competent cells Liquid.
BL21-Gold(DE3) Competent Cells Liquid.
BL21-CodonPlus (DE3)-RIPL competent cells Liquid.
BL21-Gold(DE3) pLysS Competent Cells Liquid.
pUC 18 DNA Control Plasmid Liquid.
Beta Mercaptoethanol Liquid.
XL10-Gold 2-Mercaptoethanol Liquid.
- Colour** : BL21(DE3) competent cells Not available.
BL21-Gold(DE3) Competent Cells Not available.
BL21-CodonPlus (DE3)-RIPL competent cells Not available.
BL21-Gold(DE3) pLysS Competent Cells Not available.
pUC 18 DNA Control Plasmid Not available.
Beta Mercaptoethanol Not available.
XL10-Gold 2-Mercaptoethanol Not available.
- Odour** : BL21(DE3) competent cells Not available.
BL21-Gold(DE3) Competent Cells Not available.
BL21-CodonPlus (DE3)-RIPL competent cells Not available.
BL21-Gold(DE3) pLysS Competent Cells Not available.
pUC 18 DNA Control Plasmid Not available.
Beta Mercaptoethanol Not available.
XL10-Gold 2-Mercaptoethanol Not available.

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SECTION 9: Physical and chemical properties

Odour threshold	:	<ul style="list-style-type: none"> BL21(DE3) competent cells Not available. BL21-Gold(DE3) Competent Cells Not available. BL21-CodonPlus (DE3)-RIPL competent cells Not available. BL21-Gold(DE3) pLysS Competent Cells Not available. pUC 18 DNA Control Plasmid Not available. Beta Mercaptoethanol XL10-Gold 2-Mercaptoethanol Not available.
pH	:	<ul style="list-style-type: none"> BL21(DE3) competent cells 6.4 BL21-Gold(DE3) Competent Cells 6.4 BL21-CodonPlus (DE3)-RIPL competent cells 6.4 BL21-Gold(DE3) pLysS Competent Cells 6.4 pUC 18 DNA Control Plasmid 7.5 Beta Mercaptoethanol XL10-Gold 2-Mercaptoethanol Not available.
Melting point/freezing point	:	<ul style="list-style-type: none"> BL21(DE3) competent cells Not available. BL21-Gold(DE3) Competent Cells Not available. BL21-CodonPlus (DE3)-RIPL competent cells Not available. BL21-Gold(DE3) pLysS Competent Cells Not available. pUC 18 DNA Control Plasmid 0°C Beta Mercaptoethanol XL10-Gold 2-Mercaptoethanol Not available.
Initial boiling point and boiling range	:	<ul style="list-style-type: none"> BL21(DE3) competent cells Not available. BL21-Gold(DE3) Competent Cells Not available. BL21-CodonPlus (DE3)-RIPL competent cells Not available. BL21-Gold(DE3) pLysS Competent Cells Not available. pUC 18 DNA Control Plasmid 100°C Beta Mercaptoethanol XL10-Gold 2-Mercaptoethanol Not available.
Flash point	:	<ul style="list-style-type: none"> BL21(DE3) competent cells Not available. BL21-Gold(DE3) Competent Cells Not available. BL21-CodonPlus (DE3)-RIPL competent cells Not available. BL21-Gold(DE3) pLysS Competent Cells Not available. pUC 18 DNA Control Not available.

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SECTION 9: Physical and chemical properties

		Plasmid	
		Beta Mercaptoethanol	Not available.
		XL10-Gold	Not available.
		2-Mercaptoethanol	
Evaporation rate	:	BL21(DE3) competent cells	Not available.
		BL21-Gold(DE3) Competent Cells	Not available.
		BL21-CodonPlus (DE3)-RIPL competent cells	Not available.
		BL21-Gold(DE3) pLysS Competent Cells	Not available.
		pUC 18 DNA Control	Not available.
		Plasmid	
		Beta Mercaptoethanol	Not available.
		XL10-Gold	Not available.
		2-Mercaptoethanol	
Flammability (solid, gas)	:	BL21(DE3) competent cells	Not applicable.
		BL21-Gold(DE3) Competent Cells	Not applicable.
		BL21-CodonPlus (DE3) -RIPL competent cells	Not applicable.
		BL21-Gold(DE3) pLysS Competent Cells	Not applicable.
		pUC 18 DNA Control	Not applicable.
		Plasmid	
		Beta Mercaptoethanol	Not applicable.
		XL10-Gold	Not applicable.
		2-Mercaptoethanol	
Upper/lower flammability or explosive limits	:	BL21(DE3) competent cells	Not available.
		BL21-Gold(DE3) Competent Cells	Not available.
		BL21-CodonPlus (DE3)-RIPL competent cells	Not available.
		BL21-Gold(DE3) pLysS Competent Cells	Not available.
		pUC 18 DNA Control	Not available.
		Plasmid	
		Beta Mercaptoethanol	Not available.
		XL10-Gold	Not available.
		2-Mercaptoethanol	
Vapour pressure	:	BL21(DE3) competent cells	Not available.
		BL21-Gold(DE3) Competent Cells	Not available.
		BL21-CodonPlus (DE3)-RIPL competent cells	Not available.
		BL21-Gold(DE3) pLysS Competent Cells	Not available.
		pUC 18 DNA Control	Not available.
		Plasmid	
		Beta Mercaptoethanol	Not available.
		XL10-Gold	Not available.
		2-Mercaptoethanol	

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SECTION 9: Physical and chemical properties

Vapour density	: BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol XL10-Gold 2-Mercaptoethanol	Not available. Not available. Not available. Not available. Not available. Not available. Not available.
Relative density	: BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol XL10-Gold 2-Mercaptoethanol	Not available. Not available. Not available. Not available. Not available. Not available. Not available.
Solubility(ies)	: BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol XL10-Gold 2-Mercaptoethanol	Soluble in the following materials: cold water and hot water. Soluble in the following materials: cold water and hot water. Soluble in the following materials: cold water and hot water. Soluble in the following materials: cold water and hot water. Easily soluble in the following materials: cold water and hot water. Easily soluble in the following materials: cold water and hot water. Easily soluble in the following materials: cold water and hot water.
Partition coefficient: n-octanol/water	: BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol XL10-Gold 2-Mercaptoethanol	Not available. Not available. Not available. Not available. Not available. Not available. Not available.
Auto-ignition temperature	: BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells	Not available. Not available. Not available. Not available.

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SECTION 9: Physical and chemical properties

	pUC 18 DNA Control Plasmid	Not available.
	Beta Mercaptoethanol	Not available.
	XL10-Gold	Not available.
	2-Mercaptoethanol	
Decomposition temperature	: BL21(DE3) competent cells	Not available.
	BL21-Gold(DE3) Competent Cells	Not available.
	BL21-CodonPlus (DE3)-RIPL competent cells	Not available.
	BL21-Gold(DE3) pLysS Competent Cells	Not available.
	pUC 18 DNA Control Plasmid	Not available.
	Beta Mercaptoethanol	Not available.
	XL10-Gold	Not available.
	2-Mercaptoethanol	
Viscosity	: BL21(DE3) competent cells	Not available.
	BL21-Gold(DE3) Competent Cells	Not available.
	BL21-CodonPlus (DE3)-RIPL competent cells	Not available.
	BL21-Gold(DE3) pLysS Competent Cells	Not available.
	pUC 18 DNA Control Plasmid	Not available.
	Beta Mercaptoethanol	Not available.
	XL10-Gold	Not available.
	2-Mercaptoethanol	
Explosive properties	: BL21(DE3) competent cells	Not available.
	BL21-Gold(DE3) Competent Cells	Not available.
	BL21-CodonPlus (DE3)-RIPL competent cells	Not available.
	BL21-Gold(DE3) pLysS Competent Cells	Not available.
	pUC 18 DNA Control Plasmid	Not available.
	Beta Mercaptoethanol	Not available.
	XL10-Gold	Not available.
	2-Mercaptoethanol	
Oxidising properties	: BL21(DE3) competent cells	Not available.
	BL21-Gold(DE3) Competent Cells	Not available.
	BL21-CodonPlus (DE3)-RIPL competent cells	Not available.
	BL21-Gold(DE3) pLysS Competent Cells	Not available.
	pUC 18 DNA Control Plasmid	Not available.
	Beta Mercaptoethanol	Not available.
	XL10-Gold	Not available.
	2-Mercaptoethanol	

9.2 Other information

No additional information.

SECTION 10: Stability and reactivity

10.1 Reactivity	: <input checked="" type="checkbox"/> BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol 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. 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. 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	: <input checked="" type="checkbox"/> BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol XL10-Gold 2-Mercaptoethanol	The product is stable. The product is stable. The product is stable. The product is stable. The product is stable. The product is stable. The product is stable. The product is stable.
10.3 Possibility of hazardous reactions	: <input checked="" type="checkbox"/> BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol 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. 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. 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	: <input checked="" type="checkbox"/> BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol XL10-Gold 2-Mercaptoethanol	No specific data. No specific data. No specific data. No specific data. No specific data. No specific data. No specific data. No specific data.

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SECTION 10: Stability and reactivity

10.5 Incompatible materials : **BL21(DE3) competent cells** May react or be incompatible with oxidising materials.
BL21-Gold(DE3) Competent Cells May react or be incompatible with oxidising materials.
BL21-CodonPlus (DE3)-RIPL competent cells May react or be incompatible with oxidising materials.
BL21-Gold(DE3) pLysS Competent Cells May react or be incompatible with oxidising materials.
pUC 18 DNA Control Plasmid May react or be incompatible with oxidising materials.
Beta Mercaptoethanol May react or be incompatible with oxidising materials.
XL10-Gold 2-Mercaptoethanol May react or be incompatible with oxidising materials.

10.6 Hazardous decomposition products : **BL21(DE3) competent cells** Under normal conditions of storage and use, hazardous decomposition products should not be produced.
BL21-Gold(DE3) Competent Cells Under normal conditions of storage and use, hazardous decomposition products should not be produced.
BL21-CodonPlus (DE3)-RIPL competent cells Under normal conditions of storage and use, hazardous decomposition products should not be produced.
BL21-Gold(DE3) pLysS Competent Cells Under normal conditions of storage and use, hazardous decomposition products should not be produced.
pUC 18 DNA Control Plasmid Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Beta Mercaptoethanol Under normal conditions of storage and use, hazardous decomposition products should not be produced.
XL10-Gold 2-Mercaptoethanol 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
Beta Mercaptoethanol 2-Mercaptoethanol	LD50 Dermal LD50 Oral	Rabbit Rat	167.1 mg/kg 244 mg/kg	- -
XL10-Gold 2-Mercaptoethanol Sodium chloride 2-Mercaptoethanol	LD50 Oral LD50 Dermal LD50 Oral	Rat Rabbit Rat	3000 mg/kg 167.1 mg/kg 244 mg/kg	- - -

Acute toxicity estimates

Route	ATE value
BL21(DE3) competent cells Oral	31250 mg/kg
BL21-Gold(DE3) Competent Cells Oral	31250 mg/kg
BL21-Gold(DE3) pLysS Competent Cells Oral	31250 mg/kg
Beta Mercaptoethanol Oral Dermal Inhalation (vapours)	2440 mg/kg 1671 mg/kg 20 mg/l

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XL10-Gold 2-Mercaptoethanol

Oral

Dermal

Inhalation (vapours)

5545.5 mg/kg

3797.7 mg/kg

40.5 mg/l

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
<input checked="" type="checkbox"/> Beta Mercaptoethanol 2-Mercaptoethanol	Eyes - Severe irritant	Rabbit	-	2 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	-

Sensitiser

Conclusion/Summary : 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)

Product/ingredient name	Category	Route of exposure	Target organs
<input checked="" type="checkbox"/> Beta Mercaptoethanol 2-Mercaptoethanol	Category 3	Not applicable.	Respiratory tract irritation
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.

Information on likely routes of exposure

<input checked="" type="checkbox"/> BL21(DE3) competent cells	Routes of entry anticipated: Oral, Dermal, Inhalation.
BL21-Gold(DE3) Competent Cells	Routes of entry anticipated: Oral, Dermal, Inhalation.
BL21-CodonPlus (DE3)-RIPL competent cells	Routes of entry anticipated: Oral, Dermal, Inhalation.
BL21-Gold(DE3) pLysS Competent Cells	Routes of entry anticipated: Oral, Dermal, Inhalation.
pUC 18 DNA Control Plasmid	Not available.
Beta Mercaptoethanol	Routes of entry anticipated: Oral, Dermal, Inhalation.
XL10-Gold	Routes of entry anticipated: Oral, Dermal, Inhalation.

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2-Mercaptoethanol

Potential acute health effects

Inhalation	:	BL21(DE3) competent cells	No known significant effects or critical hazards.	
		BL21-Gold(DE3) Competent Cells	No known significant effects or critical hazards.	
		BL21-CodonPlus (DE3)-RIPL competent cells	No known significant effects or critical hazards.	
		BL21-Gold(DE3) pLysS Competent Cells	No known significant effects or critical hazards.	
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.	
		Beta Mercaptoethanol	Harmful if inhaled.	
		XL10-Gold	No known significant effects or critical hazards.	
		2-Mercaptoethanol		
	Ingestion	:	BL21(DE3) competent cells	No known significant effects or critical hazards.
			BL21-Gold(DE3) Competent Cells	No known significant effects or critical hazards.
		BL21-CodonPlus (DE3)-RIPL competent cells	No known significant effects or critical hazards.	
		BL21-Gold(DE3) pLysS Competent Cells	No known significant effects or critical hazards.	
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.	
		Beta Mercaptoethanol	No known significant effects or critical hazards.	
		XL10-Gold	No known significant effects or critical hazards.	
		2-Mercaptoethanol		
Skin contact		:	BL21(DE3) competent cells	No known significant effects or critical hazards.
			BL21-Gold(DE3) Competent Cells	No known significant effects or critical hazards.
		BL21-CodonPlus (DE3)-RIPL competent cells	No known significant effects or critical hazards.	
		BL21-Gold(DE3) pLysS Competent Cells	No known significant effects or critical hazards.	
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.	
		Beta Mercaptoethanol	Harmful in contact with skin. Causes skin irritation. May cause an allergic skin reaction.	
		XL10-Gold	May cause an allergic skin reaction.	
		2-Mercaptoethanol		
	Eye contact	:	BL21(DE3) competent cells	No known significant effects or critical hazards.
			BL21-Gold(DE3) Competent Cells	No known significant effects or critical hazards.
		BL21-CodonPlus (DE3)-RIPL competent cells	No known significant effects or critical hazards.	
		BL21-Gold(DE3) pLysS Competent Cells	No known significant effects or critical hazards.	
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.	
		Beta Mercaptoethanol	Causes serious eye damage.	
		XL10-Gold	Causes serious eye damage.	
		2-Mercaptoethanol		

Symptoms related to the physical, chemical and toxicological characteristics

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SECTION 11: Toxicological information

Inhalation	: <input checked="" type="checkbox"/> BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol XL10-Gold 2-Mercaptoethanol	No specific data. No specific data. No specific data. No specific data. No specific data. No specific data. No specific data. No specific data.
Ingestion	: <input checked="" type="checkbox"/> BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol XL10-Gold 2-Mercaptoethanol	No specific data. No specific data. No specific data. No specific data. No specific data. Adverse symptoms may include the following: stomach pains Adverse symptoms may include the following: stomach pains
Skin contact	: <input checked="" type="checkbox"/> BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol XL10-Gold 2-Mercaptoethanol	No specific data. No specific data. No specific data. No specific data. No specific data. Adverse symptoms may include the following: pain or irritation redness blistering may occur Adverse symptoms may include the following: pain or irritation redness blistering may occur
Eye contact	: <input checked="" type="checkbox"/> BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	No specific data. No specific data. No specific data. No specific data. No specific data. Adverse symptoms may include the following: pain watering redness

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XL10-Gold	Adverse symptoms may include the following:
2-Mercaptoethanol	
	pain
	watering
	redness

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	:	BL21(DE3) competent cells	No known significant effects or critical hazards.
		BL21-Gold(DE3) Competent Cells	No known significant effects or critical hazards.
		BL21-CodonPlus (DE3)-RIPL competent cells	No known significant effects or critical hazards.
		BL21-Gold(DE3) pLysS Competent Cells	No known significant effects or critical hazards.
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
		Beta Mercaptoethanol	Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
		XL10-Gold	Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
		2-Mercaptoethanol	Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
Carcinogenicity	:	BL21(DE3) competent cells	No known significant effects or critical hazards.
		BL21-Gold(DE3) Competent Cells	No known significant effects or critical hazards.
		BL21-CodonPlus (DE3)-RIPL competent cells	No known significant effects or critical hazards.
		BL21-Gold(DE3) pLysS Competent Cells	No known significant effects or critical hazards.
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
		Beta Mercaptoethanol	No known significant effects or critical hazards.
		XL10-Gold	No known significant effects or critical hazards.
		2-Mercaptoethanol	No known significant effects or critical hazards.
Mutagenicity	:	BL21(DE3) competent cells	No known significant effects or critical hazards.
		BL21-Gold(DE3) Competent Cells	No known significant effects or critical hazards.
		BL21-CodonPlus (DE3)-RIPL competent cells	No known significant effects or critical hazards.
		BL21-Gold(DE3) pLysS Competent Cells	No known significant effects or critical hazards.
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
		Beta Mercaptoethanol	No known significant effects or critical hazards.
		XL10-Gold	No known significant effects or critical hazards.
		2-Mercaptoethanol	No known significant effects or critical hazards.

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Teratogenicity	: <input checked="" type="checkbox"/> BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol 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. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
Developmental effects	: <input checked="" type="checkbox"/> BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol 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. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
Fertility effects	: <input checked="" type="checkbox"/> BL21(DE3) competent cells BL21-Gold(DE3) Competent Cells BL21-CodonPlus (DE3)-RIPL competent cells BL21-Gold(DE3) pLysS Competent Cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol 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. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
<input checked="" type="checkbox"/> XL10-Gold 2-Mercaptoethanol Sodium chloride	Acute EC50 4.74 g/L Fresh water	Algae - Chlamydomonas reinhardtii	96 hours
	Acute EC50 519.6 mg/l Fresh water	Crustaceans - Cypris subglobosa	48 hours
	Acute EC50 402600 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute IC50 6.87 g/L Fresh water	Aquatic plants - Lemna minor	96 hours
	Acute LC50 1000000 µg/l Fresh water	Fish - Morone saxatilis - Larvae	96 hours
	Chronic LC10 781 mg/l Fresh water	Crustaceans - Hyalella azteca - Juvenile (Fledgling, Hatchling, Weanling)	3 weeks
	Chronic NOEC 6 g/L Fresh water	Aquatic plants - Lemna minor	96 hours
Chronic NOEC 0.314 g/L Fresh water	Daphnia - Daphnia pulex	21 days	
Chronic NOEC 100 mg/l Fresh water	Fish - Gambusia holbrooki - Adult	8 weeks	

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SECTION 12: Ecological information

12.2 Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
Beta Mercaptoethanol 2-Mercaptoethanol	OECD 310 Ready Biodegradability - CO2 in Sealed Vessels (Headspace Test)	69 % - Inherent - 60 days	20 mg/l	-
XL10-Gold 2-Mercaptoethanol 2-Mercaptoethanol	OECD 310 Ready Biodegradability - CO2 in Sealed Vessels (Headspace Test)	69 % - Inherent - 60 days	20 mg/l	-

12.3 Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
Beta Mercaptoethanol 2-Mercaptoethanol	-0.056	-	low
XL10-Gold 2-Mercaptoethanol 2-Mercaptoethanol	-0.056	-	low

12.4 Mobility in soil

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

Mobility : Not available.

12.5 Results of PBT and vPvB assessment

PBT : Not applicable.

vPvB : Not applicable.

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

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Methods of disposal : 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.

Hazardous waste : The classification of the product may meet the criteria for a hazardous waste.

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SECTION 13: Disposal considerations

- Methods of disposal** : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.
- Special precautions** : 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 14: Transport information

- ADR/RID / IMDG / IATA** : Not regulated.
- 14.6 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.
- 14.7 Transport in bulk according to Annex II of Marpol and the IBC Code** : Not available.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

- Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles** :
- | | |
|-------------------------------------------|-----------------|
| BL21(DE3) competent cells | Not applicable. |
| BL21-Gold(DE3) Competent Cells | Not applicable. |
| BL21-CodonPlus (DE3)-RIPL competent cells | Not applicable. |
| BL21-Gold(DE3) pLysS Competent Cells | Not applicable. |
| pUC 18 DNA Control Plasmid | Not applicable. |
| Beta Mercaptoethanol | Not applicable. |
| XL10-Gold | Not applicable. |
| 2-Mercaptoethanol | |

Other EU regulations

- Industrial emissions (integrated pollution prevention and control) - Air** : Listed

Ozone depleting substances (1005/2009/EU)

Not listed.

Prior Informed Consent (PIC) (649/2012/EU)

Not listed.

Seveso Directive

This product is not controlled under the Seveso Directive.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

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SECTION 15: Regulatory information

Montreal Protocol (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

Australia	: All components are listed or exempted.
Canada	: All components are listed or exempted.
China	: Not determined.
Europe	: All components are listed or exempted.
Japan	: <input checked="" type="checkbox"/> Japan inventory (ENCS) : Not determined. Japan inventory (ISHL) : All components are listed or exempted.
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.
Thailand	: <input checked="" type="checkbox"/> Not determined.
Turkey	: Not determined.
United States	: All components are listed or exempted.
Viet Nam	: <input checked="" type="checkbox"/> Not determined.

15.2 Chemical safety assessment : This product contains substances for which Chemical Safety Assessments might still be required.

SECTION 16: Other information

Indicates information that has changed from previously issued version.

Abbreviations and acronyms	: ATE = Acute Toxicity Estimate CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008] DNEL = Derived No Effect Level EUH statement = CLP-specific Hazard statement PNEC = Predicted No Effect Concentration RRN = REACH Registration Number
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Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
<input checked="" type="checkbox"/> Beta Mercaptoethanol Acute Tox. 4, H312 Acute Tox. 4, H332 Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Chronic 3, H412	Calculation method Calculation method Calculation method Calculation method Calculation method Calculation method
XL10-Gold 2-Mercaptoethanol Eye Dam. 1, H318 Skin Sens. 1, H317	Calculation method Calculation method

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SECTION 16: Other information

Aquatic Chronic 3, H412

Calculation method

Full text of abbreviated H statements

<p>Beta Mercaptoethanol H301 H310 H312 H315 H317 H318 H330 H332 H335 H411 H412</p> <p>XL10-Gold 2-Mercaptoethanol H301 H310 H315 H317 H318 H319 H330 H335 H411 H412</p>	<p>Toxic if swallowed. Fatal in contact with skin. Harmful in contact with skin. Causes skin irritation. May cause an allergic skin reaction. Causes serious eye damage. Fatal if inhaled. Harmful if inhaled. May cause respiratory irritation. Toxic to aquatic life with long lasting effects. Harmful to aquatic life with long lasting effects.</p> <p>Toxic if swallowed. Fatal in contact with skin. Causes skin irritation. May cause an allergic skin reaction. Causes serious eye damage. Causes serious eye irritation. Fatal if inhaled. May cause respiratory irritation. Toxic to aquatic life with long lasting effects. Harmful to aquatic life with long lasting effects.</p>
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Full text of classifications [CLP/GHS]

<p>Beta Mercaptoethanol Acute Tox. 2, H310 Acute Tox. 2, H330 Acute Tox. 3, H301 Acute Tox. 4, H312 Acute Tox. 4, H332 Aquatic Chronic 2, H411 Aquatic Chronic 3, H412 Eye Dam. 1, H318 Skin Irrit. 2, H315 Skin Sens. 1, H317 STOT SE 3, H335</p> <p>XL10-Gold 2-Mercaptoethanol Acute Tox. 2, H310 Acute Tox. 2, H330 Acute Tox. 3, H301 Aquatic Chronic 2, H411 Aquatic Chronic 3, H412 Eye Dam. 1, H318 Eye Irrit. 2, H319 Skin Irrit. 2, H315 Skin Sens. 1, H317 STOT SE 3, H335</p>	<p>ACUTE TOXICITY (dermal) - Category 2 ACUTE TOXICITY (inhalation) - Category 2 ACUTE TOXICITY (oral) - Category 3 ACUTE TOXICITY (dermal) - Category 4 ACUTE TOXICITY (inhalation) - Category 4 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 2 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1 SKIN CORROSION/IRRITATION - Category 2 SKIN SENSITISATION - Category 1 SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE (Respiratory tract irritation) - Category 3</p> <p>ACUTE TOXICITY (dermal) - Category 2 ACUTE TOXICITY (inhalation) - Category 2 ACUTE TOXICITY (oral) - Category 3 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 2 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2 SKIN CORROSION/IRRITATION - Category 2 SKIN SENSITISATION - Category 1 SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE (Respiratory tract irritation) - Category 3</p>
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Date of previous issue : 31/01/2016

Version : 2

Notice to reader

Date of issue/Date of revision : 27/06/2018

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SECTION 16: Other information

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