

SAFETY DATA SHEET



Protein Expression Competent Cell Pack, Part Number 230246

Section 1. Identification

1.1 Product identifier

Product name : Protein Expression Competent Cell Pack, Part Number 230246
Part no. (chemical kit) : 230246
Part no. : 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

Validation date : 12/21/2021

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

Material uses : Analytical reagent.
 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

Supplier/Manufacturer : Agilent Technologies, Inc.
 5301 Stevens Creek Blvd
 Santa Clara, CA 95051, USA
 800-227-9770

1.4 Emergency telephone number

In case of emergency : CHEMTREC®: 1-800-424-9300

Section 2. Hazards identification

2.1 Classification of the substance or mixture

OSHA/HCS status : BL21(DE3) Competent Cells This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
 BL21-Gold(DE3) Competent Cells This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
 BL21-CodonPlus (DE3)-RIPL competent cells This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
 BL21-Gold(DE3) pLysS Competent Cells This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
 pUC 18 DNA Control Plasmid While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.
 Beta Mercaptoethanol This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
 XL10-Gold This material is considered hazardous by the OSHA

Section 2. Hazards identification

2-Mercaptoethanol

Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture

BL21(DE3) Competent Cells

H320 EYE IRRITATION - Category 2B

BL21-Gold(DE3) Competent Cells

H320 EYE IRRITATION - Category 2B

BL21-CodonPlus (DE3)-RIPL competent cells

H320 EYE IRRITATION - Category 2B

BL21-Gold(DE3) pLysS Competent Cells

H320 EYE IRRITATION - Category 2B

Beta Mercaptoethanol

H312 ACUTE TOXICITY (dermal) - Category 4
 H315 SKIN IRRITATION - Category 2
 H318 SERIOUS EYE DAMAGE - Category 1
 H317 SKIN SENSITIZATION - Category 1
 H361 TOXIC TO REPRODUCTION - Category 2
 H373 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2
 H412 AQUATIC HAZARD (LONG-TERM) - Category 3

XL10-Gold 2-Mercaptoethanol

H318 SERIOUS EYE DAMAGE - Category 1
 H317 SKIN SENSITIZATION - Category 1
 H361 TOXIC TO REPRODUCTION - Category 2
 H373 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2
 H412 AQUATIC HAZARD (LONG-TERM) - Category 3

BL21(DE3) Competent Cells Percentage of the mixture consisting of ingredient (s) of unknown hazards to the aquatic environment: 5%

BL21-Gold(DE3) Competent Cells Percentage of the mixture consisting of ingredient (s) of unknown hazards to the aquatic environment: 5%

BL21-CodonPlus (DE3)-RIPL competent cells Percentage of the mixture consisting of ingredient (s) of unknown hazards to the aquatic environment: 5%

BL21-Gold(DE3) pLysS Competent Cells Percentage of the mixture consisting of ingredient (s) of unknown hazards to the aquatic environment: 5%

2.2 GHS label elements

Hazard pictograms

: Beta Mercaptoethanol



XL10-Gold 2-Mercaptoethanol



Signal word

:

Section 2. Hazards identification

	BL21(DE3) Competent Cells	Warning	
	BL21-Gold(DE3) Competent Cells	Warning	
	BL21-CodonPlus (DE3)-RIPL competent cells	Warning	
	BL21-Gold(DE3) pLysS Competent Cells	Warning	
	pUC 18 DNA Control Plasmid	No signal word.	
	Beta Mercaptoethanol	Danger	
	XL10-Gold 2-Mercaptoethanol	Danger	
Hazard statements	: BL21(DE3) Competent Cells	H320 - Causes eye irritation.	
	BL21-Gold(DE3) Competent Cells	H320 - Causes eye irritation.	
	BL21-CodonPlus (DE3)-RIPL competent cells	H320 - Causes eye irritation.	
	BL21-Gold(DE3) pLysS Competent Cells	H320 - Causes eye irritation.	
	pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.	
	Beta Mercaptoethanol	H312 - Harmful in contact with skin. H315 - Causes skin irritation. H317 - May cause an allergic skin reaction. H318 - Causes serious eye damage. H361 - Suspected of damaging fertility or the unborn child. H373 - May cause damage to organs through prolonged or repeated exposure. (heart, liver)	
		H412 - Harmful to aquatic life with long lasting effects.	
	XL10-Gold 2-Mercaptoethanol	H317 - May cause an allergic skin reaction. H318 - Causes serious eye damage. H361 - Suspected of damaging fertility or the unborn child. H373 - May cause damage to organs through prolonged or repeated exposure. (heart, liver)	
		H412 - Harmful to aquatic life with long lasting effects.	
<u>Precautionary statements</u>			
Prevention			
	: 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	P201 - Obtain special instructions before use. P280 - Wear protective gloves, protective clothing and eye or face protection. P273 - Avoid release to the environment. P260 - Do not breathe vapor. P264 - Wash thoroughly after handling.	
		P201 - Obtain special instructions before use. P280 - Wear protective gloves, protective clothing and eye or face protection. P273 - Avoid release to the environment. P260 - Do not breathe vapor.	
	XL10-Gold 2-Mercaptoethanol	P201 - Obtain special instructions before use. P280 - Wear protective gloves, protective clothing and eye or face protection. P273 - Avoid release to the environment. P260 - Do not breathe vapor.	

Section 2. Hazards identification

Response	: BL21(DE3) Competent Cells	P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P337 + P313 - If eye irritation persists: Get medical advice or attention.
	BL21-Gold(DE3) Competent Cells	P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P337 + P313 - If eye irritation persists: Get medical advice or attention.
	BL21-CodonPlus (DE3)-RIPL competent cells	P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P337 + P313 - If eye irritation persists: Get medical advice or attention.
	BL21-Gold(DE3) pLysS Competent Cells	P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P337 + P313 - If eye irritation persists: Get medical advice or attention.
	pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not applicable. P308 + P313 - IF exposed or concerned: Get medical advice or attention. P362 + P364 - Take off contaminated clothing and wash it before reuse. P363 - Wash contaminated clothing before reuse. P302 + P312, P352 - IF ON SKIN: Call a POISON CENTER or doctor if you feel unwell. Wash with plenty of water. P333 + P313 - If skin irritation or rash occurs: Get medical advice or attention. P305 + P351 + P338, P310 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor.
	XL10-Gold 2-Mercaptoethanol	P308 + P313 - IF exposed or concerned: Get medical advice or attention. P363 - Wash contaminated clothing before reuse. P302 + P352 - IF ON SKIN: Wash with plenty of water. P333 + P313 - If skin irritation or rash occurs: Get medical advice or attention. P305 + P351 + P338, P310 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor.
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.

Section 2. Hazards identification

Disposal	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	Not applicable. Not applicable. Not applicable. Not applicable. Not applicable. Not applicable. P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations. P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
Supplemental label elements	: 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	None known. None known. None known. None known. None known. None known. None known. None known.

2.3 Other hazards

Hazards not otherwise classified	: 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	None known. None known. None known. None known. None known. None known. None known. None known.
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Section 3. Composition/information on ingredients

Substance/mixture	: 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	Mixture Mixture Mixture Mixture Mixture Mixture Mixture
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Ingredient name	%	CAS number
BL21(DE3) Competent Cells		
Glycerol	≥10 - ≤25	56-81-5
Dimethyl sulfoxide	≤10	67-68-5
Potassium chloride	≤3	7447-40-7
BL21-Gold(DE3) Competent Cells		
Glycerol	≥10 - ≤25	56-81-5
Dimethyl sulfoxide	≤10	67-68-5
Potassium chloride	≤3	7447-40-7
BL21-CodonPlus (DE3)-RIPL competent cells		

Section 3. Composition/information on ingredients

Glycerol	≥10 - ≤25	56-81-5
Dimethyl sulfoxide	≤10	67-68-5
Potassium chloride	≤3	7447-40-7
BL21-Gold(DE3) pLysS Competent Cells		
Glycerol	≥10 - ≤25	56-81-5
Dimethyl sulfoxide	≤10	67-68-5
Potassium chloride	≤3	7447-40-7
Beta Mercaptoethanol		
2-Mercaptoethanol	≤12	60-24-2
XL10-Gold 2-Mercaptoethanol		
Sodium chloride	≥10 - ≤25	7647-14-5
2-Mercaptoethanol	≤5	60-24-2

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

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

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

Section 4. First aid measures

4.1 Description of necessary first aid measures

Eye contact	: 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. Continue to rinse for at least 10 minutes. If irritation persists, get medical attention.
	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. Continue to rinse for at least 10 minutes. If irritation persists, get medical attention.
	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. Continue to rinse for at least 10 minutes. If irritation persists, get medical attention.
	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. Continue to rinse for at least 10 minutes. If irritation persists, get medical attention.
	pUC 18 DNA Control Plasmid	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.
	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	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.

Section 4. First aid measures

Inhalation

: BL21(DE3) Competent Cells

Chemical burns must be treated promptly by a physician.

Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

BL21-Gold(DE3) Competent Cells

Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

BL21-CodonPlus (DE3)-RIPL competent cells

Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

BL21-Gold(DE3) pLysS Competent Cells

Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

pUC 18 DNA Control Plasmid

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

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

Section 4. First aid measures

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 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. Wash clothing before reuse. Clean shoes thoroughly before reuse.

BL21-Gold(DE3) Competent Cells

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

BL21-CodonPlus (DE3)-RIPL competent cells

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

BL21-Gold(DE3) pLysS Competent Cells

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Clean shoes thoroughly before reuse.

pUC 18 DNA Control Plasmid

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

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

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Ingestion

: BL21(DE3) Competent Cells

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.

Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs.

Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

BL21-Gold(DE3) Competent Cells

Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs.

Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

BL21-CodonPlus (DE3)-RIPL competent cells

Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs.

Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

BL21-Gold(DE3) pLysS Competent Cells

Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs.

Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention

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

4.2 Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact	: 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	Causes eye irritation. Causes eye irritation. Causes eye irritation. Causes eye irritation. No known significant effects or critical hazards. Causes serious eye damage. Causes serious eye damage.
Inhalation	: 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.

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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 Beta Mercaptoethanol	No known significant effects or critical hazards. Harmful in contact with skin. Causes skin irritation. May cause an allergic skin reaction.
	XL10-Gold 2-Mercaptoethanol	May cause an allergic skin reaction.
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 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.
<u>Over-exposure signs/symptoms</u>		
Eye contact	: BL21(DE3) Competent Cells	Adverse symptoms may include the following: irritation watering redness
	BL21-Gold(DE3) Competent Cells	Adverse symptoms may include the following: irritation watering redness
	BL21-CodonPlus (DE3)-RIPL competent cells	Adverse symptoms may include the following: irritation watering redness
	BL21-Gold(DE3) pLysS Competent Cells	Adverse symptoms may include the following: irritation watering redness
	pUC 18 DNA Control Plasmid Beta Mercaptoethanol	No specific data. 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 Beta Mercaptoethanol	No specific data. Adverse symptoms may include the following: reduced fetal weight increase in fetal deaths skeletal malformations
	XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following:

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		reduced fetal weight increase in fetal deaths skeletal malformations
Skin contact	: 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.
	XL10-Gold 2-Mercaptoethanol	No specific data. Adverse symptoms may include the following: pain or irritation redness blistering may occur reduced fetal weight increase in fetal deaths skeletal malformations Adverse symptoms may include the following: pain or irritation redness blistering may occur reduced fetal weight increase in fetal deaths skeletal malformations
Ingestion	: 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.
	XL10-Gold 2-Mercaptoethanol	No specific data. Adverse symptoms may include the following: stomach pains reduced fetal weight increase in fetal deaths skeletal malformations Adverse symptoms may include the following: stomach pains reduced fetal weight increase in fetal deaths skeletal malformations

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

Notes to physician	: BL21(DE3) Competent Cells	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
	BL21-Gold(DE3) Competent Cells	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
	BL21-CodonPlus (DE3)-RIPL competent cells	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
	BL21-Gold(DE3) pLysS Competent Cells	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
	pUC 18 DNA Control Plasmid	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
	Beta Mercaptoethanol	Treat symptomatically. Contact poison treatment

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	XL10-Gold 2-Mercaptoethanol	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	: BL21(DE3) Competent Cells	No specific treatment.
	BL21-Gold(DE3) Competent Cells	No specific treatment.
	BL21-CodonPlus (DE3)-RIPL competent cells	No specific treatment.
	BL21-Gold(DE3) pLysS Competent Cells	No specific treatment.
	pUC 18 DNA Control Plasmid	No specific treatment.
	Beta Mercaptoethanol	No specific treatment.
	XL10-Gold 2-Mercaptoethanol	No specific treatment.
Protection of first-aiders	: BL21(DE3) Competent Cells	No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
	BL21-Gold(DE3) Competent Cells	No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
	BL21-CodonPlus (DE3)-RIPL competent cells	No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
	BL21-Gold(DE3) pLysS Competent Cells	No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
	pUC 18 DNA Control Plasmid	No action shall be taken involving any personal risk or without suitable training.
	Beta 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.
	XL10-Gold 2-Mercaptoethanol	No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

5.1 Extinguishing media

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

5.2 Special hazards arising from the substance or mixture

Specific hazards arising from the chemical	: BL21(DE3) Competent Cells	In a fire or if heated, a pressure increase will occur and the container may burst.
	BL21-Gold(DE3) Competent Cells	In a fire or if heated, a pressure increase will occur and the container may burst.
	BL21-CodonPlus (DE3)-RIPL competent cells	In a fire or if heated, a pressure increase will occur and the container may burst.
	BL21-Gold(DE3) pLysS Competent Cells	In a fire or if heated, a pressure increase will occur and the container may burst.
	pUC 18 DNA Control Plasmid	In a fire or if heated, a pressure increase will occur and the container may burst.
	Beta Mercaptoethanol	In a fire or if heated, a pressure increase will occur and the container may burst. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
	XL10-Gold 2-Mercaptoethanol	In a fire or if heated, a pressure increase will occur and the container may burst. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
Hazardous thermal decomposition products	: BL21(DE3) Competent Cells	Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides halogenated compounds metal oxide/oxides
	BL21-Gold(DE3) Competent Cells	Decomposition products may include the following materials: carbon dioxide

Section 5. Fire-fighting measures

BL21-CodonPlus (DE3)-RIPL competent cells	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
BL21-Gold(DE3) pLysS Competent Cells	Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides halogenated compounds metal oxide/oxides
pUC 18 DNA Control Plasmid Beta Mercaptoethanol	No specific data. Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides
XL10-Gold 2-Mercaptoethanol	Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides halogenated compounds metal oxide/oxides

5.3 Advice for firefighters

Special protective actions for fire-fighters

: 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

Section 5. Fire-fighting measures

Special protective equipment for fire-fighters	: BL21(DE3) Competent Cells	action shall be taken involving any personal risk or without suitable training. Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
	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.
	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.
	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.
	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.
	Beta Mercaptoethanol	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
	XL10-Gold 2-Mercaptoethanol	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	: 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 spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. 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 spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. 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 spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate

Section 6. Accidental release measures

BL21-Gold(DE3) pLysS Competent Cells	personal protective equipment. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
pUC 18 DNA Control Plasmid	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment.
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 spilled material. Do not breathe vapor 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 spilled material. Do not breathe vapor 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 specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
BL21-Gold(DE3) Competent Cells	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
BL21-CodonPlus (DE3)-RIPL competent cells	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
BL21-Gold(DE3) pLysS Competent Cells	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
pUC 18 DNA Control Plasmid	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Beta Mercaptoethanol	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
XL10-Gold 2-Mercaptoethanol	If specialized clothing is required to deal with the spillage, take note of any information in Section 8

Section 6. Accidental release measures

6.2 Environmental precautions

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

6.3 Methods and materials for containment and cleaning up

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

Section 6. Accidental release measures

BL21-Gold(DE3) pLysS Competent Cells	inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor. 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.

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). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
	BL21-Gold(DE3) Competent Cells	Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
	BL21-CodonPlus (DE3)-RIPL competent cells	Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
	BL21-Gold(DE3) pLysS Competent Cells	Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept

Section 7. Handling and storage

tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

pUC 18 DNA Control Plasmid

Put on appropriate personal protective equipment (see Section 8).

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. Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor 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.

XL10-Gold 2-Mercaptoethanol

Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapor 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.

Advice on general occupational hygiene

: BL21(DE3) Competent Cells

Potentially biohazardous material. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

BL21-Gold(DE3) Competent Cells

Potentially biohazardous material. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

BL21-CodonPlus (DE3)-RIPL competent cells

Potentially biohazardous material. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated

Section 7. Handling and storage

BL21-Gold(DE3) pLysS
Competent Cells

clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Potentially biohazardous material. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

pUC 18 DNA Control Plasmid

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Beta Mercaptoethanol

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

XL10-Gold 2-Mercaptoethanol

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities

: 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 unlabeled 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 unlabeled 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

Section 7. Handling and storage

BL21-Gold(DE3) pLysS
Competent Cells

until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

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

XL10-Gold 2-Mercaptoethanol

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

[7.3 Specific end use\(s\)](#)

Section 7. Handling and storage

Recommendations	: BL21(DE3) Competent Cells	Industrial applications, Professional applications.
	BL21-Gold(DE3) Competent Cells	Industrial applications, Professional applications.
	BL21-CodonPlus (DE3)-RIPL competent cells	Industrial applications, Professional applications.
	BL21-Gold(DE3) pLysS Competent Cells	Industrial applications, Professional applications.
	pUC 18 DNA Control Plasmid	Industrial applications, Professional applications.
	Beta Mercaptoethanol	Industrial applications, Professional applications.
	XL10-Gold 2-Mercaptoethanol	Industrial applications, Professional applications.
Industrial sector specific solutions	: 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.

Section 8. Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
BL21(DE3) Competent Cells Glycerol	OSHA PEL 1989 (United States, 3/1989). TWA: 5 mg/m ³ 8 hours. Form: Respirable fraction TWA: 10 mg/m ³ 8 hours. Form: Total dust OSHA PEL (United States, 5/2018). TWA: 5 mg/m ³ 8 hours. Form: Respirable fraction TWA: 15 mg/m ³ 8 hours. Form: Total dust
Dimethyl sulfoxide	OARS WEEL (United States, 1/2021). TWA: 250 ppm 8 hours.
Potassium chloride	None.
BL21-Gold(DE3) Competent Cells Glycerol	OSHA PEL 1989 (United States, 3/1989). TWA: 5 mg/m ³ 8 hours. Form: Respirable fraction TWA: 10 mg/m ³ 8 hours. Form: Total dust OSHA PEL (United States, 5/2018). TWA: 5 mg/m ³ 8 hours. Form: Respirable fraction TWA: 15 mg/m ³ 8 hours. Form: Total dust
Dimethyl sulfoxide	OARS WEEL (United States, 1/2021). TWA: 250 ppm 8 hours.
Potassium chloride	None.
BL21-CodonPlus (DE3)-RIPL competent cells Glycerol	OSHA PEL 1989 (United States, 3/1989). TWA: 5 mg/m ³ 8 hours. Form: Respirable fraction TWA: 10 mg/m ³ 8 hours. Form: Total dust OSHA PEL (United States, 5/2018). TWA: 5 mg/m ³ 8 hours. Form: Respirable fraction

Section 8. Exposure controls/personal protection

Dimethyl sulfoxide	TWA: 15 mg/m ³ 8 hours. Form: Total dust OARS WEEL (United States, 1/2021).
Potassium chloride	TWA: 250 ppm 8 hours. None.
BL21-Gold(DE3) pLysS Competent Cells	
Glycerol	OSHA PEL 1989 (United States, 3/1989). TWA: 5 mg/m ³ 8 hours. Form: Respirable fraction TWA: 10 mg/m ³ 8 hours. Form: Total dust OSHA PEL (United States, 5/2018). TWA: 5 mg/m ³ 8 hours. Form: Respirable fraction TWA: 15 mg/m ³ 8 hours. Form: Total dust
Dimethyl sulfoxide	OARS WEEL (United States, 1/2021). TWA: 250 ppm 8 hours.
Potassium chloride	None.
Beta Mercaptoethanol	
2-Mercaptoethanol	OARS WEEL (United States, 1/2021). Absorbed through skin. TWA: 0.2 ppm 8 hours.
XL10-Gold 2-Mercaptoethanol	
Sodium chloride	None.
2-Mercaptoethanol	OARS WEEL (United States, 1/2021). Absorbed through skin. TWA: 0.2 ppm 8 hours.

8.2 Exposure controls

Appropriate engineering controls

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

Environmental exposure controls

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

Individual protection measures

Hygiene measures

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

Eye/face protection

: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.

Skin protection

Section 8. Exposure controls/personal protection

- Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties and safety characteristics

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

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. | |
| | Color | : 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. | |
| Odor | : 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. | |
| Odor threshold | : 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. | |

Section 9. Physical and chemical properties and safety characteristics

	XL10-Gold 2-Mercaptoethanol	Not available.
pH	: 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	Not available.
	XL10-Gold 2-Mercaptoethanol	Not available.
Melting point/freezing point	: 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 (32°F)
	Beta Mercaptoethanol	Not available.
	XL10-Gold 2-Mercaptoethanol	Not available.
Boiling point, initial boiling point, and boiling range	: 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 (212°F)
	Beta Mercaptoethanol	Not available.
	XL10-Gold 2-Mercaptoethanol	Not available.

Flash point

Ingredient name	Closed cup			Open cup		
	°C	°F	Method	°C	°F	Method
BL21(DE3) Competent Cells						
Dimethyl sulfoxide	87	188.6	ASTM D 93	87	188.6	
Glycerol			Pensky-Martens	177	350.6	
BL21-Gold(DE3) Competent Cells						
Dimethyl sulfoxide	87	188.6	ASTM D 93	87	188.6	
Glycerol			Pensky-Martens	177	350.6	
BL21-CodonPlus (DE3)-RIPL competent cells						
Dimethyl sulfoxide	87	188.6	ASTM D 93	87	188.6	
Glycerol			Pensky-Martens	177	350.6	
BL21-Gold(DE3) pLysS Competent Cells						
Dimethyl sulfoxide	87	188.6	ASTM D 93	87	188.6	
Glycerol			Pensky-Martens	177	350.6	
pUC 18 DNA Control Plasmid						
Edetic acid	>100	>212	DIN 51758			

Section 9. Physical and chemical properties and safety characteristics

Beta Mercaptoethanol					
2-Mercaptoethanol	74	165.2		74	165.2
XL10-Gold 2-Mercaptoethanol					
2-Mercaptoethanol	74	165.2		74	165.2

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 Plasmid	Not available.
		Beta Mercaptoethanol	Not available.
		XL10-Gold 2-Mercaptoethanol	Not available.
	Flammability	:	BL21(DE3) Competent Cells
		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 2-Mercaptoethanol	Not applicable.
Lower and upper explosion limit/flammability limit		:	BL21(DE3) Competent Cells
		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.

Vapor pressure	:		Vapor Pressure at 20°C			Vapor pressure at 50°C		
		Ingredient name	mm Hg	kPa	Method	mm Hg	kPa	Method
		BL21(DE3) Competent Cells						
		Water	23.8	3.2		92.258	12.3	
		Dimethyl sulfoxide	0.42	0.056	EU A.4			
		BL21-Gold(DE3) Competent Cells						
		Water	23.8	3.2		92.258	12.3	
		Dimethyl sulfoxide	0.42	0.056	EU A.4			
		BL21-CodonPlus (DE3)-RIPL competent cells						
		Water	23.8	3.2		92.258	12.3	
		Dimethyl sulfoxide	0.42	0.056	EU A.4			
		BL21-Gold(DE3) pLysS						

Section 9. Physical and chemical properties and safety characteristics

Competent Cells						
Water	23.8	3.2			92.258	12.3
Dimethyl sulfoxide	0.42	0.056	EU A.4			
pUC 18 DNA Control Plasmid						
Water	23.8	3.2			92.258	12.3
2-Amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride	0	0			0.000007501	0.000001
Beta Mercaptoethanol						
Water	23.8	3.2			92.258	12.3
2-Mercaptoethanol	0.98	0.13				
XL10-Gold 2-Mercaptoethanol						
Water	23.8	3.2			92.258	12.3
2-Mercaptoethanol	0.98	0.13				

Relative vapor density :

- 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.

Relative density :

- 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.

Solubility :

- BL21(DE3) Competent Cells Soluble in the following materials: cold water and hot water.
- BL21-Gold(DE3) Competent Cells Soluble in the following materials: cold water and hot water.
- BL21-CodonPlus (DE3)-RIPL competent cells Soluble in the following materials: cold water and hot water.
- BL21-Gold(DE3) pLysS Competent Cells Soluble in the following materials: cold water and hot water.
- pUC 18 DNA Control Plasmid Easily soluble in the following materials: cold water and hot water.
- Beta Mercaptoethanol Easily soluble in the following materials: cold water and hot water.
- XL10-Gold 2-Mercaptoethanol Easily soluble in the following materials: cold water and hot water.

Section 9. Physical and chemical properties and safety characteristics

Partition coefficient: n-octanol/water	: 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 2-Mercaptoethanol	Not applicable.

Auto-ignition temperature	: Ingredient name	°C	°F	Method
	BL21(DE3) Competent Cells			
	Dimethyl sulfoxide	300 to 302	572 to 575.6	
	Glycerol	370	698	
	BL21-Gold(DE3) Competent Cells			
	Dimethyl sulfoxide	300 to 302	572 to 575.6	
	Glycerol	370	698	
	BL21-CodonPlus (DE3)-RIPL competent cells			
	Dimethyl sulfoxide	300 to 302	572 to 575.6	
	Glycerol	370	698	
	BL21-Gold(DE3) pLysS Competent Cells			
	Dimethyl sulfoxide	300 to 302	572 to 575.6	
	Glycerol	370	698	
	pUC 18 DNA Control Plasmid			
	Edetic acid	>400	>752	VDI 2263
	Beta Mercaptoethanol			
2-Mercaptoethanol	295	563		
XL10-Gold 2-Mercaptoethanol				
2-Mercaptoethanol	295	563		

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 2-Mercaptoethanol	Not available.

Section 9. Physical and chemical properties and safety characteristics

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 2-Mercaptoethanol	Not available.

Particle characteristics

Median particle size	: 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 2-Mercaptoethanol	Not applicable.

Section 10. Stability and reactivity

10.1 Reactivity	: BL21(DE3) Competent Cells	No specific test data related to reactivity available for this product or its ingredients.
	BL21-Gold(DE3) Competent Cells	No specific test data related to reactivity available for this product or its ingredients.
	BL21-CodonPlus (DE3)-RIPL competent cells	No specific test data related to reactivity available for this product or its ingredients.
	BL21-Gold(DE3) pLysS Competent Cells	No specific test data related to reactivity available for this product or its ingredients.
	pUC 18 DNA Control Plasmid	No specific test data related to reactivity available for this product or its ingredients.
	Beta Mercaptoethanol	No specific test data related to reactivity available for this product or its ingredients.
	XL10-Gold 2-Mercaptoethanol	No specific test data related to reactivity available for this product or its ingredients.
10.2 Chemical stability	: BL21(DE3) Competent Cells	The product is stable.
	BL21-Gold(DE3) Competent Cells	The product is stable.
	BL21-CodonPlus (DE3)-RIPL competent cells	The product is stable.
	BL21-Gold(DE3) pLysS Competent Cells	The product is stable.
	pUC 18 DNA Control Plasmid	The product is stable.
	Beta Mercaptoethanol	The product is stable.
10.3 Possibility of hazardous reactions	: BL21(DE3) Competent Cells	Under normal conditions of storage and use, hazardous reactions will not occur.
	BL21-Gold(DE3) Competent Cells	Under normal conditions of storage and use, hazardous reactions will not occur.
	BL21-CodonPlus (DE3)-RIPL competent cells	Under normal conditions of storage and use, hazardous reactions will not occur.
	BL21-Gold(DE3) pLysS Competent Cells	Under normal conditions of storage and use, hazardous reactions will not occur.
	pUC 18 DNA Control Plasmid	Under normal conditions of storage and use, hazardous reactions will not occur.
Beta Mercaptoethanol	Under normal conditions of storage and use, hazardous reactions will not occur.	

Section 10. Stability and reactivity

XL10-Gold 2-Mercaptoethanol Under normal conditions of storage and use, hazardous reactions will not occur.

10.4 Conditions to avoid :

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.

10.5 Incompatible materials :

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

Section 11. Toxicological information

Product/ingredient name	Result	Species	Dose	Exposure
BL21(DE3) Competent Cells				
Glycerol	LD50 Oral	Rat	12600 mg/kg	-
Dimethyl sulfoxide	LD50 Dermal	Rat	40000 mg/kg	-
	LD50 Oral	Rat	14500 mg/kg	-
Potassium chloride	LD50 Oral	Rat	2600 mg/kg	-
BL21-Gold(DE3) Competent Cells				
Glycerol	LD50 Oral	Rat	12600 mg/kg	-
Dimethyl sulfoxide	LD50 Dermal	Rat	40000 mg/kg	-
	LD50 Oral	Rat	14500 mg/kg	-
Potassium chloride	LD50 Oral	Rat	2600 mg/kg	-
BL21-CodonPlus (DE3)-RIPL competent cells				
Glycerol	LD50 Oral	Rat	12600 mg/kg	-
Dimethyl sulfoxide	LD50 Dermal	Rat	40000 mg/kg	-
	LD50 Oral	Rat	14500 mg/kg	-
Potassium chloride	LD50 Oral	Rat	2600 mg/kg	-
BL21-Gold(DE3) pLysS Competent Cells				
Glycerol	LD50 Oral	Rat	12600 mg/kg	-
Dimethyl sulfoxide	LD50 Dermal	Rat	40000 mg/kg	-
	LD50 Oral	Rat	14500 mg/kg	-
Potassium chloride	LD50 Oral	Rat	2600 mg/kg	-
Beta Mercaptoethanol				
2-Mercaptoethanol	LD50 Oral	Rat	244 mg/kg	-
XL10-Gold 2-Mercaptoethanol				
Sodium chloride	LD50 Oral	Rat	3000 mg/kg	-
2-Mercaptoethanol	LD50 Oral	Rat	244 mg/kg	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
BL21(DE3) Competent Cells					
Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
Dimethyl sulfoxide	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Eyes - Mild irritant	Rabbit	-	100 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
Potassium chloride	Skin - Mild irritant	Rabbit	-	100 mg	-
	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
BL21-Gold(DE3) Competent Cells					
Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-

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Dimethyl sulfoxide	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Eyes - Mild irritant	Rabbit	-	100 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
Potassium chloride	Skin - Mild irritant	Rabbit	-	100 mg	-
	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
BL21-CodonPlus (DE3)-RIPL competent cells					
Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
Dimethyl sulfoxide	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Eyes - Mild irritant	Rabbit	-	100 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
Potassium chloride	Skin - Mild irritant	Rabbit	-	100 mg	-
	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
BL21-Gold(DE3) pLysS Competent Cells					
Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
Dimethyl sulfoxide	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Eyes - Mild irritant	Rabbit	-	100 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
Potassium chloride	Skin - Mild irritant	Rabbit	-	100 mg	-
	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
Beta Mercaptoethanol					
2-Mercaptoethanol	Eyes - Severe irritant	Rabbit	-	2 mg	-
XL10-Gold 2-Mercaptoethanol					
Sodium chloride	Eyes - Moderate irritant	Rabbit	-	24 hours 100 mg	-
	Eyes - Moderate irritant	Rabbit	-	10 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
2-Mercaptoethanol	Eyes - Severe irritant	Rabbit	-	2 mg	-

Sensitization

Not available.

Mutagenicity

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

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Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

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

Specific target organ toxicity (repeated exposure)

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

Aspiration hazard

Not available.

Information on the likely routes of exposure

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 2-Mercaptoethanol	Routes of entry anticipated: Oral, Dermal, Inhalation.

Potential acute health effects

Eye contact

BL21(DE3) Competent Cells	Causes eye irritation.
BL21-Gold(DE3) Competent Cells	Causes eye irritation.
BL21-CodonPlus (DE3)-RIPL competent cells	Causes eye irritation.
BL21-Gold(DE3) pLysS Competent Cells	Causes eye irritation.
pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
Beta Mercaptoethanol	Causes serious eye damage.
XL10-Gold 2-Mercaptoethanol	Causes serious eye damage.

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.

Section 11. Toxicological information

	Beta Mercaptoethanol	No known significant effects or critical hazards.
	XL10-Gold 2-Mercaptoethanol	No known significant effects or critical hazards.
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 2-Mercaptoethanol	May cause an allergic skin reaction.
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 2-Mercaptoethanol	No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact	: BL21(DE3) Competent Cells	Adverse symptoms may include the following: irritation watering redness
	BL21-Gold(DE3) Competent Cells	Adverse symptoms may include the following: irritation watering redness
	BL21-CodonPlus (DE3)-RIPL competent cells	Adverse symptoms may include the following: irritation watering redness
	BL21-Gold(DE3) pLysS Competent Cells	Adverse symptoms may include the following: irritation watering redness
	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	Adverse symptoms may include the following: reduced fetal weight

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	XL10-Gold 2-Mercaptoethanol	increase in fetal deaths skeletal malformations Adverse symptoms may include the following: reduced fetal weight increase in fetal deaths skeletal malformations
Skin contact	: 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 or irritation redness blistering may occur reduced fetal weight increase in fetal deaths skeletal malformations
	XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following: pain or irritation redness blistering may occur reduced fetal weight increase in fetal deaths skeletal malformations
Ingestion	: 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: stomach pains reduced fetal weight increase in fetal deaths skeletal malformations
	XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following: stomach pains reduced fetal weight increase in fetal deaths skeletal malformations

Delayed and immediate effects and also 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

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General	<ul style="list-style-type: none"> : 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 	<p>No known significant effects or critical hazards.</p> <p>No known significant effects or critical hazards.</p> <p>No known significant effects or critical hazards.</p> <p>No known significant effects or critical hazards.</p> <p>No known significant effects or critical hazards.</p> <p>May cause damage to organs through prolonged or repeated exposure. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.</p> <p>May cause damage to organs through prolonged or repeated exposure. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.</p>
Carcinogenicity	<ul style="list-style-type: none"> : 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 	<p>No known significant effects or critical hazards.</p> <p>No known significant effects or critical hazards.</p> <p>No known significant effects or critical hazards.</p> <p>No known significant effects or critical hazards.</p> <p>No known significant effects or critical hazards.</p> <p>No known significant effects or critical hazards.</p> <p>No known significant effects or critical hazards.</p>
Mutagenicity	<ul style="list-style-type: none"> : 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 	<p>No known significant effects or critical hazards.</p> <p>No known significant effects or critical hazards.</p> <p>No known significant effects or critical hazards.</p> <p>No known significant effects or critical hazards.</p> <p>No known significant effects or critical hazards.</p> <p>No known significant effects or critical hazards.</p> <p>No known significant effects or critical hazards.</p>
Reproductive toxicity	<ul style="list-style-type: none"> : 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 	<p>No known significant effects or critical hazards.</p> <p>No known significant effects or critical hazards.</p> <p>No known significant effects or critical hazards.</p> <p>No known significant effects or critical hazards.</p> <p>No known significant effects or critical hazards.</p> <p>No known significant effects or critical hazards.</p> <p>Suspected of damaging fertility or the unborn child.</p> <p>Suspected of damaging fertility or the unborn child.</p>

Numerical measures of toxicity

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapors) (mg/l)	Inhalation (dusts and mists) (mg/l)
BL21(DE3) Competent Cells					
BL21(DE3) Competent Cells	136842.1	N/A	N/A	N/A	N/A
Glycerol	12600	N/A	N/A	N/A	N/A
Dimethyl sulfoxide	14500	40000	N/A	N/A	N/A
Potassium chloride	2600	N/A	N/A	N/A	N/A
BL21-Gold(DE3) Competent Cells					
BL21-Gold(DE3) Competent Cells	136842.1	N/A	N/A	N/A	N/A

Section 11. Toxicological information

Glycerol	12600	N/A	N/A	N/A	N/A
Dimethyl sulfoxide	14500	40000	N/A	N/A	N/A
Potassium chloride	2600	N/A	N/A	N/A	N/A
BL21-CodonPlus (DE3)-RIPL competent cells					
BL21-CodonPlus (DE3)-RIPL competent cells	136842.1	N/A	N/A	N/A	N/A
Glycerol	12600	N/A	N/A	N/A	N/A
Dimethyl sulfoxide	14500	40000	N/A	N/A	N/A
Potassium chloride	2600	N/A	N/A	N/A	N/A
BL21-Gold(DE3) pLysS Competent Cells					
BL21-Gold(DE3) pLysS Competent Cells	136842.1	N/A	N/A	N/A	N/A
Glycerol	12600	N/A	N/A	N/A	N/A
Dimethyl sulfoxide	14500	40000	N/A	N/A	N/A
Potassium chloride	2600	N/A	N/A	N/A	N/A
Beta Mercaptoethanol					
Beta Mercaptoethanol	2440	2000	N/A	30	N/A
2-Mercaptoethanol	244	200	N/A	3	N/A
XL10-Gold 2-Mercaptoethanol					
XL10-Gold 2-Mercaptoethanol	4615.5	4545.5	N/A	60.7	N/A
Sodium chloride	3000	N/A	N/A	N/A	N/A
2-Mercaptoethanol	244	200	N/A	3	N/A

Section 12. Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
BL21(DE3) Competent Cells			
Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
Dimethyl sulfoxide	Acute LC50 25000 ppm Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
	Acute LC50 34000000 µg/l Fresh water	Fish - Pimephales promelas	96 hours
	Chronic NOEC 100 ul/L Marine water	Algae - Ulva lactuca	72 hours
	Chronic NOEC 100 ul/L Fresh water	Daphnia - Daphnia magna - Juvenile (Fledgling, Hatchling, Weanling)	21 days
Potassium chloride	Acute EC50 1337000 µg/l Fresh water	Algae - Navicula seminulum	96 hours
	Acute EC50 9.24 g/L Fresh water	Algae - Desmodesmus subspicatus	72 hours
	Acute EC50 83000 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 9.68 mg/l Fresh water	Crustaceans - Pseudosida ramosa - Neonate	48 hours
	Acute LC50 509.65 mg/l Fresh water	Fish - Danio rerio	96 hours
BL21-Gold(DE3) Competent Cells			
Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
Dimethyl sulfoxide	Acute LC50 25000 ppm Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
	Acute LC50 34000000 µg/l Fresh water	Fish - Pimephales promelas	96 hours
	Chronic NOEC 100 ul/L Marine water	Algae - Ulva lactuca	72 hours
	Chronic NOEC 100 ul/L Fresh water	Daphnia - Daphnia magna - Juvenile (Fledgling, Hatchling, Weanling)	21 days

Section 12. Ecological information

Potassium chloride	Acute EC50 1337000 µg/l Fresh water Acute EC50 9.24 g/L Fresh water	Algae - Navicula seminulum Algae - Desmodesmus subspicatus	96 hours 72 hours
	Acute EC50 83000 µg/l Fresh water Acute LC50 9.68 mg/l Fresh water	Daphnia - Daphnia magna Crustaceans - Pseudosida ramosa - Neonate	48 hours 48 hours
	Acute LC50 509.65 mg/l Fresh water	Fish - Danio rerio	96 hours
BL21-CodonPlus (DE3)-RIPL competent cells			
Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
Dimethyl sulfoxide	Acute LC50 25000 ppm Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
	Acute LC50 34000000 µg/l Fresh water Chronic NOEC 100 ul/L Marine water Chronic NOEC 100 ul/L Fresh water	Fish - Pimephales promelas Algae - Ulva lactuca Daphnia - Daphnia magna - Juvenile (Fledgling, Hatchling, Weanling)	96 hours 72 hours 21 days
Potassium chloride	Acute EC50 1337000 µg/l Fresh water Acute EC50 9.24 g/L Fresh water	Algae - Navicula seminulum Algae - Desmodesmus subspicatus	96 hours 72 hours
	Acute EC50 83000 µg/l Fresh water Acute LC50 9.68 mg/l Fresh water	Daphnia - Daphnia magna Crustaceans - Pseudosida ramosa - Neonate	48 hours 48 hours
	Acute LC50 509.65 mg/l Fresh water	Fish - Danio rerio	96 hours
BL21-Gold(DE3) pLysS Competent Cells			
Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
Dimethyl sulfoxide	Acute LC50 25000 ppm Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
	Acute LC50 34000000 µg/l Fresh water Chronic NOEC 100 ul/L Marine water Chronic NOEC 100 ul/L Fresh water	Fish - Pimephales promelas Algae - Ulva lactuca Daphnia - Daphnia magna - Juvenile (Fledgling, Hatchling, Weanling)	96 hours 72 hours 21 days
Potassium chloride	Acute EC50 1337000 µg/l Fresh water Acute EC50 9.24 g/L Fresh water	Algae - Navicula seminulum Algae - Desmodesmus subspicatus	96 hours 72 hours
	Acute EC50 83000 µg/l Fresh water Acute LC50 9.68 mg/l Fresh water	Daphnia - Daphnia magna Crustaceans - Pseudosida ramosa - Neonate	48 hours 48 hours
	Acute LC50 509.65 mg/l Fresh water	Fish - Danio rerio	96 hours
XL10-Gold 2-Mercaptoethanol			
Sodium chloride	Acute EC50 2430000 µg/l Fresh water Acute EC50 519.6 mg/l Fresh water Acute EC50 402.6 mg/l Fresh water Acute IC50 6.87 g/L Fresh water Acute LC50 1000000 µg/l Fresh water Chronic LC10 781 mg/l Fresh water	Algae - Navicula seminulum Crustaceans - Cypris subglobosa Daphnia - Daphnia magna Aquatic plants - Lemna minor Fish - Morone saxatilis - Larvae Crustaceans - Hyalella azteca - Juvenile (Fledgling, Hatchling, Weanling)	96 hours 48 hours 48 hours 96 hours 96 hours 3 weeks
	Chronic NOEC 6 g/L Fresh water Chronic NOEC 0.314 g/L Fresh water Chronic NOEC 100 mg/l Fresh water	Aquatic plants - Lemna minor Daphnia - Daphnia pulex Fish - Gambusia holbrooki - Adult	96 hours 21 days 8 weeks

[12.2 Persistence and degradability](#)

Section 12. Ecological information

Product/ingredient name	Test	Result	Dose	Inoculum
BL21(DE3) Competent Cells Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-
Dimethyl sulfoxide	OECD 301D Ready Biodegradability - Closed Bottle Test	31 % - Not readily - 28 days	-	-
BL21-Gold(DE3) Competent Cells Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-
Dimethyl sulfoxide	OECD 301D Ready Biodegradability - Closed Bottle Test	31 % - Not readily - 28 days	-	-
BL21-CodonPlus (DE3)-RIPL competent cells Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-
Dimethyl sulfoxide	OECD 301D Ready Biodegradability - Closed Bottle Test	31 % - Not readily - 28 days	-	-
BL21-Gold(DE3) pLysS Competent Cells Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-
Dimethyl sulfoxide	OECD 301D Ready Biodegradability - Closed Bottle Test	31 % - Not readily - 28 days	-	-
Beta Mercaptoethanol 2-Mercaptoethanol	OECD 310 Ready Biodegradability - CO ₂ in Sealed Vessels (Headspace Test)	69 % - Not readily - 60 days	20 mg/l	-
XL10-Gold 2-Mercaptoethanol 2-Mercaptoethanol	OECD 310	69 % - Not readily - 60 days	20 mg/l	-

Section 12. Ecological information

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
BL21(DE3) Competent Cells Dimethyl sulfoxide Potassium chloride	- -	- -	Not readily Readily
BL21-Gold(DE3) Competent Cells Dimethyl sulfoxide Potassium chloride	- -	- -	Not readily Readily
BL21-CodonPlus (DE3)-RIPL competent cells Dimethyl sulfoxide Potassium chloride	- -	- -	Not readily Readily
BL21-Gold(DE3) pLysS Competent Cells Dimethyl sulfoxide Potassium chloride	- -	- -	Not readily Readily
Beta Mercaptoethanol 2-Mercaptoethanol	-	-	Not readily
XL10-Gold 2-Mercaptoethanol 2-Mercaptoethanol	-	-	Not readily

12.3 Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
BL21(DE3) Competent Cells Glycerol Dimethyl sulfoxide Potassium chloride	-1.76 -1.35 -0.46	- 3.16 -	low low low
BL21-Gold(DE3) Competent Cells Glycerol Dimethyl sulfoxide Potassium chloride	-1.76 -1.35 -0.46	- 3.16 -	low low low
BL21-CodonPlus (DE3)-RIPL competent cells Glycerol Dimethyl sulfoxide Potassium chloride	-1.76 -1.35 -0.46	- 3.16 -	low low low
BL21-Gold(DE3) pLysS Competent Cells Glycerol Dimethyl sulfoxide Potassium chloride	-1.76 -1.35 -0.46	- 3.16 -	low low low

Section 12. Ecological information

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.

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

Section 13. Disposal considerations

13.1 Waste treatment methods

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

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

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

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

Section 14. Transport information

DOT / TDG / Mexico / IMDG / IATA : Not regulated.

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

Transport in bulk according to IMO instruments : Not available.

Section 15. Regulatory information

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

U.S. Federal regulations : TSCA 8(a) CDR Exempt/Partial exemption: Not determined
Clean Water Act (CWA) 311: Edetic acid

Clean Air Act Section 112 : Listed

(b) Hazardous Air Pollutants (HAPs)

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

No products were found.

SARA 304 RQ : Not applicable.

SARA 311/312

Classification

BL21(DE3) Competent Cells	EYE IRRITATION - Category 2B
BL21-Gold(DE3) Competent Cells	EYE IRRITATION - Category 2B
BL21-CodonPlus (DE3)-RIPL competent cells	EYE IRRITATION - Category 2B
BL21-Gold(DE3) pLysS Competent Cells	EYE IRRITATION - Category 2B
pUC 18 DNA Control Plasmid	Not applicable.
Beta Mercaptoethanol	ACUTE TOXICITY (dermal) - Category 4 SKIN IRRITATION - Category 2 SERIOUS EYE DAMAGE - Category 1 SKIN SENSITIZATION - Category 1 TOXIC TO REPRODUCTION - Category 2
XL10-Gold 2-Mercaptoethanol	SERIOUS EYE DAMAGE - Category 1 SKIN SENSITIZATION - Category 1 TOXIC TO REPRODUCTION - Category 2

Composition/information on ingredients

Name	%	Classification
BL21(DE3) Competent Cells		
Glycerol	≥10 - ≤25	EYE IRRITATION - Category 2B
Dimethyl sulfoxide	≤10	FLAMMABLE LIQUIDS - Category 4 EYE IRRITATION - Category 2B
Sucrose	≤10	COMBUSTIBLE DUSTS
Potassium chloride	≤3	EYE IRRITATION - Category 2B
BL21-Gold(DE3) Competent Cells		
Glycerol	≥10 - ≤25	EYE IRRITATION - Category 2B
Dimethyl sulfoxide	≤10	FLAMMABLE LIQUIDS - Category 4 EYE IRRITATION - Category 2B
Sucrose	≤10	COMBUSTIBLE DUSTS
Potassium chloride	≤3	EYE IRRITATION - Category 2B
BL21-CodonPlus (DE3)-RIPL competent cells		
Glycerol	≥10 - ≤25	EYE IRRITATION - Category 2B
Dimethyl sulfoxide	≤10	FLAMMABLE LIQUIDS - Category 4 EYE IRRITATION - Category 2B COMBUSTIBLE DUSTS

Section 15. Regulatory information

Sucrose	≤10	
Potassium chloride	≤3	EYE IRRITATION - Category 2B
BL21-Gold(DE3) pLysS Competent Cells		
Glycerol	≥10 - ≤25	EYE IRRITATION - Category 2B
Dimethyl sulfoxide	≤10	FLAMMABLE LIQUIDS - Category 4 EYE IRRITATION - Category 2B
Sucrose	≤10	COMBUSTIBLE DUSTS
Potassium chloride	≤3	EYE IRRITATION - Category 2B
Beta Mercaptoethanol		
2-Mercaptoethanol	≤12	FLAMMABLE LIQUIDS - Category 4 ACUTE TOXICITY (oral) - Category 3 ACUTE TOXICITY (dermal) - Category 2 ACUTE TOXICITY (inhalation) - Category 3 SKIN IRRITATION - Category 2 SERIOUS EYE DAMAGE - Category 1 SKIN SENSITIZATION - Category 1A TOXIC TO REPRODUCTION - Category 2 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2
XL10-Gold 2-Mercaptoethanol		
Sodium chloride	≥10 - ≤25	EYE IRRITATION - Category 2A
2-Mercaptoethanol	≤5	FLAMMABLE LIQUIDS - Category 4 ACUTE TOXICITY (oral) - Category 3 ACUTE TOXICITY (dermal) - Category 2 ACUTE TOXICITY (inhalation) - Category 3 SKIN IRRITATION - Category 2 SERIOUS EYE DAMAGE - Category 1 SKIN SENSITIZATION - Category 1A TOXIC TO REPRODUCTION - Category 2 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2

State regulations

- Massachusetts** : The following components are listed: GLYCERINE MIST; SUCROSE DUST; 2-MERCAPTOETHANOL
- New York** : None of the components are listed.
- New Jersey** : The following components are listed: GLYCERIN; 1,2,3-PROPANETRIOL; DIMETHYL SULFOXIDE; METHANE, SULFINYLBI-; THIOGLYCOL; ETHANOL, 2-MERCAPTO-; 2-MERCAPTOETHANOL
- Pennsylvania** : The following components are listed: 1,2,3-PROPANETRIOL; .ALPHA.-D-GLUCOPYRANOSIDE, .BETA.-D-FRUCTOFURANOSYL; ETHANOL, 2-MERCAPTO-

California Prop. 65

This product does not require a Safe Harbor warning under California Prop. 65.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

Section 15. Regulatory information

[UNECE Aarhus Protocol on POPs and Heavy Metals](#)

Not listed.

[Inventory list](#)

Australia	: All components are listed or exempted.
Canada	: All components are listed or exempted.
China	: Not determined.
Europe	: All components are listed or exempted.
Japan	: Japan inventory (CSCL) : Not determined. Japan inventory (ISHL) : All components are listed or exempted.
New Zealand	: Not determined.
Philippines	: Not determined.
Republic of Korea	: All components are listed or exempted.
Taiwan	: All components are listed or exempted.
Thailand	: Not determined.
Turkey	: Not determined.
United States	: All components are active or exempted.
Viet Nam	: Not determined.

Section 16. Other information

[Procedure used to derive the classification](#)

Classification	Justification
BL21(DE3) Competent Cells EYE IRRITATION - Category 2B	Calculation method
BL21-Gold(DE3) Competent Cells EYE IRRITATION - Category 2B	Calculation method
BL21-CodonPlus (DE3)-RIPL competent cells EYE IRRITATION - Category 2B	Calculation method
BL21-Gold(DE3) pLysS Competent Cells EYE IRRITATION - Category 2B	Calculation method
Beta Mercaptoethanol ACUTE TOXICITY (dermal) - Category 4 SKIN IRRITATION - Category 2 SERIOUS EYE DAMAGE - Category 1 SKIN SENSITIZATION - Category 1 TOXIC TO REPRODUCTION - Category 2 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2 AQUATIC HAZARD (LONG-TERM) - Category 3	Calculation method Calculation method Calculation method Calculation method Calculation method Calculation method Calculation method
XL10-Gold 2-Mercaptoethanol SERIOUS EYE DAMAGE - Category 1 SKIN SENSITIZATION - Category 1 TOXIC TO REPRODUCTION - Category 2 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2 AQUATIC HAZARD (LONG-TERM) - Category 3	Calculation method Calculation method Calculation method Calculation method Calculation method

[History](#)

Date of issue	: 12/21/2021
Date of previous issue	: 12/22/2020

Section 16. Other information

Version : 5

Key to abbreviations :

- ATE = Acute Toxicity Estimate
- BCF = Bioconcentration Factor
- GHS = Globally Harmonized System of Classification and Labelling of Chemicals
- IATA = International Air Transport Association
- IBC = Intermediate Bulk Container
- IMDG = International Maritime Dangerous Goods
- LogPow = logarithm of the octanol/water partition coefficient
- MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
- N/A = Not available
- UN = United Nations

✔ Indicates information that has changed from previously issued version.

Notice to reader

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