

SAFETY DATA SHEET

Lambda CE6 Induction Kit, Part Number 235200

Section 1. Identification

1.1 Product identifier

Product name : Lambda CE6 Induction Kit, Part Number 235200

Part No. (Chemical Kit) : 235200

Part No. : Lambda CE6 Bacteriophage 235200-41
 LE392 host cells 200266-81
 BL21 competent cells 200133-41
 pUC 18 DNA Control Plasmid 200231-42
 Beta Mercaptoethanol 210200-43

Validation date : 12/31/2017

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

Material uses : Analytical reagent.

Lambda CE6 Bacteriophage 1 ml ($\geq 5.0 \times 10^9$ pfu/ml)
 LE392 host cells 0.5 ml
 BL21 competent cells 1 ml (5 x 0.2 ml)
 pUC 18 DNA Control Plasmid 0.01 ml (0.1 ng/ μ l)
 Beta Mercaptoethanol 0.025 ml (25 μ l 1.42M)

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 : Lambda CE6 Bacteriophage This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

LE392 host cells This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

BL21 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).

Classification of the substance or mixture

Section 2. Hazards identification

Lambda CE6 Bacteriophage

H319	EYE IRRITATION - Category 2A
H351	CARCINOGENICITY - Category 2
H361	TOXIC TO REPRODUCTION (Unborn child) - Category 2
H372	SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (kidneys, liver) - Category 1

LE392 host cells

H319	EYE IRRITATION - Category 2A
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BL21 competent cells

H320	EYE IRRITATION - Category 2B
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Beta Mercaptoethanol




H312	ACUTE TOXICITY (dermal) - Category 4
H332	ACUTE TOXICITY (inhalation) - Category 4
H315	SKIN IRRITATION - Category 2
H318	SERIOUS EYE DAMAGE - Category 1
H317	SKIN SENSITIZATION - Category 1

Ingredients of unknown toxicity

LE392 host cells	Percentage of the mixture consisting of ingredient (s) of unknown inhalation toxicity: 10 - 30%
BL21 competent cells	Percentage of the mixture consisting of ingredient (s) of unknown dermal toxicity: 1 - 10%
	Percentage of the mixture consisting of ingredient (s) of unknown inhalation toxicity: 10 - 30%

2.2 GHS label elements

Hazard pictograms

Lambda CE6 Bacteriophage	
LE392 host cells	
Beta Mercaptoethanol	

Signal word

Lambda CE6 Bacteriophage	Danger
LE392 host cells	Warning
BL21 competent cells	Warning
pUC 18 DNA Control Plasmid	No signal word.
Beta Mercaptoethanol	Danger


Hazard statements

Lambda CE6 Bacteriophage	H319 - Causes serious eye irritation. H361 - Suspected of damaging the unborn child. H351 - Suspected of causing cancer. H372 - Causes damage to organs through prolonged or repeated exposure. (kidneys, liver)
LE392 host cells	H319 - Causes serious eye irritation.
BL21 competent cells	H320 - Causes eye irritation.
pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
Beta Mercaptoethanol	H312 + H332 - Harmful in contact with skin or if inhaled.

Section 2. Hazards identification

Precautionary statements

Prevention

:  Lambda CE6 Bacteriophage


H318 - Causes serious eye damage.
 H315 - Causes skin irritation.
 H317 - May cause an allergic skin reaction.

LE392 host cells

P201 - Obtain special instructions before use.
 P202 - Do not handle until all safety precautions have been read and understood.
 P280 - Wear protective gloves. Wear eye or face protection. Wear protective clothing.
 P260 - Do not breathe vapor.
 P270 - Do not eat, drink or smoke when using this product.
 P264 - Wash hands thoroughly after handling.
 P280 - Wear eye or face protection.
 P264 - Wash hands thoroughly after handling.
 P264 - Wash hands thoroughly after handling.
 Not applicable.
 P280 - Wear protective gloves. Wear eye or face protection. Wear protective clothing.
 P271 - Use only outdoors or in a well-ventilated area.
 P261 - Avoid breathing vapor.
 P264 - Wash hands thoroughly after handling.
 P272 (OSHA) - Contaminated work clothing must not be allowed out of the workplace.

BL21 competent cells
 pUC 18 DNA Control Plasmid
 Beta Mercaptoethanol

Response

:  Lambda CE6 Bacteriophage

P314 - Get medical attention if you feel unwell.
 P308 + P313 - IF exposed or concerned: Get medical attention.
 P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P337 + P313 - If eye irritation persists: Get medical attention.
 P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P337 + P313 - If eye irritation persists: Get medical attention.
 P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P337 + P313 - If eye irritation persists: Get medical attention.
 Not applicable.
 P304 + P340 + P312 - IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or physician if you feel unwell.
 P302 + P352 + P312 + P363 - IF ON SKIN: Wash with plenty of soap and water. Call a POISON CENTER or physician if you feel unwell. Wash contaminated clothing before reuse.
 P333 + P313 - If skin irritation or rash occurs: Get medical attention.
 P305 + P351 + P338 + P310 - IF IN EYES: Rinse

LE392 host cells

BL21 competent cells

pUC 18 DNA Control Plasmid
 Beta Mercaptoethanol

Section 2. Hazards identification

cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or physician.

Storage : Lambda CE6 Bacteriophage
 LE392 host cells
 BL21 competent cells
 pUC 18 DNA Control Plasmid
 Beta Mercaptoethanol

P405 - Store locked up.
 Not applicable.
 Not applicable.
 Not applicable.
 Not applicable.

Disposal : Lambda CE6 Bacteriophage

 LE392 host cells
 BL21 competent cells
 pUC 18 DNA Control Plasmid
 Beta Mercaptoethanol

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

Supplemental label elements : Lambda CE6 Bacteriophage
 LE392 host cells
 BL21 competent cells
 pUC 18 DNA Control Plasmid
 Beta Mercaptoethanol

None known.
 None known.
 None known.
 None known.
 None known.

2.3 Other hazards

Hazards not otherwise classified : Lambda CE6 Bacteriophage
 LE392 host cells
 BL21 competent cells
 pUC 18 DNA Control Plasmid
 Beta Mercaptoethanol

None known.
 None known.
 None known.
 None known.
 None known.

Section 3. Composition/information on ingredients

Substance/mixture	: <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage	Mixture
	LE392 host cells	Mixture
	BL21 competent cells	Mixture
	pUC 18 DNA Control Plasmid	Mixture
	Beta Mercaptoethanol	Mixture

Ingredient name	%	CAS number
<input checked="" type="checkbox"/> Lambda CE6 Bacteriophage		
Dimethyl sulfoxide	≤10	67-68-5
Trichloromethane	≤5	67-66-3
LE392 host cells		
Glycerol	≥10 - ≤25	56-81-5
Sodium chloride	≤3	7647-14-5
BL21 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

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



Section 3. Composition/information on ingredients

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

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

Section 4. First aid measures

4.1 Description of necessary first aid measures

Eye contact	:  Lambda CE6 Bacteriophage	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. Get medical attention.
	LE392 host 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. Get medical attention.
	BL21 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.
Inhalation	:  Lambda CE6 Bacteriophage	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 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. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
	LE392 host 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

Section 4. First aid measures

and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

BL21 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 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

: Lambda CE6 Bacteriophage

Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. Wash clothing before reuse. Clean shoes thoroughly before reuse.

LE392 host 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 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

Section 4. First aid measures

Ingestion

:  Lambda CE6 Bacteriophage

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

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

LE392 host cells

Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

BL21 competent cells

Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

pUC 18 DNA Control Plasmid

Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Beta Mercaptoethanol

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

Section 4. First aid measures

air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

4.2 Most important symptoms/effects, acute and delayed




Potential acute health effects

Eye contact	: <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Causes serious eye irritation. Causes serious eye irritation. Causes eye irritation. No known significant effects or critical hazards. Causes serious eye damage.
Inhalation	: <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta 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. Harmful if inhaled.
Skin contact	: <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta 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. Harmful in contact with skin. Causes skin irritation. May cause an allergic skin reaction.
Ingestion	: <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta 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.



Over-exposure signs/symptoms

Eye contact	: <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage	Adverse symptoms may include the following: pain or irritation watering redness
	LE392 host cells	Adverse symptoms may include the following: pain or irritation watering redness
	BL21 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


Section 4. First aid measures

Inhalation	:  Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Adverse symptoms may include the following: reduced fetal weight increase in fetal deaths skeletal malformations No specific data. No specific data. No specific data. No specific data.
Skin contact	:  Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Adverse symptoms may include the following: reduced fetal weight increase in fetal deaths skeletal malformations No specific data. No specific data. No specific data. Adverse symptoms may include the following: pain or irritation redness blistering may occur
Ingestion	:  Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Adverse symptoms may include the following: reduced fetal weight increase in fetal deaths skeletal malformations No specific data. No specific data. No specific data. Adverse symptoms may include the following: stomach pains

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

Notes to physician	:  Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments	:  Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	No specific treatment. No specific treatment. No specific treatment. No specific treatment. No specific treatment.



Section 4. First aid measures

Protection of first-aiders	:  Lambda CE6 Bacteriophage	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.
	LE392 host 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 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.


See toxicological information (Section 11)

Section 5. Fire-fighting measures

5.1 Extinguishing media


Suitable extinguishing media	:  Lambda CE6 Bacteriophage	Use an extinguishing agent suitable for the surrounding fire.
	LE392 host cells	Use an extinguishing agent suitable for the surrounding fire.
	BL21 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.
Unsuitable extinguishing media	:  Lambda CE6 Bacteriophage	None known.
	LE392 host cells	None known.
	BL21 competent cells	None known.
	pUC 18 DNA Control Plasmid	None known.
	Beta Mercaptoethanol	None known.

5.2 Special hazards arising from the substance or mixture

Specific hazards arising from the chemical	:  Lambda CE6 Bacteriophage	In a fire or if heated, a pressure increase will occur and the container may burst.
	LE392 host cells	In a fire or if heated, a pressure increase will occur and the container may burst.
	BL21 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.


Section 5. Fire-fighting measures

Hazardous thermal decomposition products


:  Lambda CE6 Bacteriophage	Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides halogenated compounds carbonyl halides
LE392 host cells	Decomposition products may include the following materials: carbon dioxide carbon monoxide halogenated compounds metal oxide/oxides
BL21 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

5.3 Advice for firefighters

Special protective actions for fire-fighters

:  Lambda CE6 Bacteriophage	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.
LE392 host 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 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.

Special protective equipment for fire-fighters

:  Lambda CE6 Bacteriophage	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
LE392 host 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 competent cells	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus


Section 5. Fire-fighting measures

pUC 18 DNA Control Plasmid	(SCBA) with a full face-piece operated in positive pressure mode. Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
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.

Section 6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

:  Lambda CE6 Bacteriophage

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.

LE392 host 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 competent cells

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


pUC 18 DNA Control Plasmid


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

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.

Section 6. Accidental release measures

<p>For emergency responders :  Lambda CE6 Bacteriophage</p> <p>LE392 host cells</p> <p>BL21 competent cells</p> <p>pUC 18 DNA Control Plasmid</p> <p>Beta Mercaptoethanol</p>	<p>If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel". 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". 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". 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". If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".</p>
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<p>6.2 Environmental precautions :  Lambda CE6 Bacteriophage</p> <p>LE392 host cells</p> <p>BL21 competent cells</p> <p>pUC 18 DNA Control Plasmid</p> <p>Beta Mercaptoethanol</p>	<p>Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).</p> <p>Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).</p> <p>Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).</p> <p>Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).</p> <p>Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).</p>
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6.3 Methods and materials for containment and cleaning up

<p>Methods for cleaning up :  Lambda CE6 Bacteriophage</p> <p>LE392 host cells</p>	<p>Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.</p> <p>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</p>
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Section 6. Accidental release measures

BL21 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.

Section 7. Handling and storage

7.1 Precautions for safe handling

Protective measures :  Lambda CE6 Bacteriophage

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

LE392 host 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 competent cells
Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

pUC 18 DNA Control Plasmid
Put on appropriate personal protective equipment (see Section 8).

Beta Mercaptoethanol
Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin

Section 7. Handling and storage

<p>Advice on general occupational hygiene</p>	<p>:  Lambda CE6 Bacteriophage</p> <p>LE392 host cells</p> <p>BL21 competent cells</p> <p>pUC 18 DNA Control Plasmid</p> <p>Beta Mercaptoethanol</p>	<p>sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.</p> <p>Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.</p> <p>Potentially biohazardous material. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.</p> <p>Potentially biohazardous material. Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.</p> <p>Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.</p> <p>Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.</p>
<p>7.2 Conditions for safe storage, including any incompatibilities</p>	<p>:  Lambda CE6 Bacteriophage</p>	<p>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.</p>

Section 7. Handling and storage

LE392 host cells

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.

BL21 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.

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.

7.3 Specific end use(s)

Recommendations

:  Lambda CE6 Bacteriophage
LE392 host cells
BL21 competent cells
pUC 18 DNA Control Plasmid
Beta Mercaptoethanol

Industrial applications, Professional applications.
Industrial applications, Professional applications.
Industrial applications, Professional applications.
Industrial applications, Professional applications.
Industrial applications, Professional applications.

Section 7. Handling and storage

Industrial sector specific solutions	: <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage	Not applicable.
	LE392 host cells	Not applicable.
	BL21 competent cells	Not applicable.
	pUC 18 DNA Control Plasmid	Not applicable.
	Beta Mercaptoethanol	Not applicable.

Section 8. Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
<input checked="" type="checkbox"/> Lambda CE6 Bacteriophage Dimethyl sulfoxide Trichloromethane	<p>AIHA WEEL (United States, 10/2011). TWA: 250 ppm 8 hours.</p> <p>ACGIH TLV (United States, 3/2017). TWA: 10 ppm 8 hours. TWA: 49 mg/m³ 8 hours.</p> <p>OSHA PEL 1989 (United States, 3/1989). TWA: 2 ppm 8 hours. TWA: 9.78 mg/m³ 8 hours.</p> <p>NIOSH REL (United States, 10/2016). STEL: 2 ppm 60 minutes. STEL: 9.78 mg/m³ 60 minutes.</p> <p>OSHA PEL (United States, 6/2016). CEIL: 50 ppm CEIL: 240 mg/m³</p>
LE392 host cells Glycerol	<p>OSHA PEL 1989 (United States, 3/1989). TWA: 5 mg/m³ 8 hours. Form: Respirable fraction TWA: 10 mg/m³ 8 hours. Form: Total dust</p> <p>OSHA PEL (United States, 6/2016). TWA: 5 mg/m³ 8 hours. Form: Respirable fraction TWA: 15 mg/m³ 8 hours. Form: Total dust</p> <p>None.</p>
Sodium chloride	<p>OSHA PEL 1989 (United States, 3/1989). TWA: 5 mg/m³ 8 hours. Form: Respirable fraction TWA: 10 mg/m³ 8 hours. Form: Total dust</p> <p>OSHA PEL (United States, 6/2016). TWA: 5 mg/m³ 8 hours. Form: Respirable fraction TWA: 15 mg/m³ 8 hours. Form: Total dust</p> <p>None.</p>
BL21 competent cells Glycerol	<p>OSHA PEL 1989 (United States, 3/1989). TWA: 5 mg/m³ 8 hours. Form: Respirable fraction TWA: 10 mg/m³ 8 hours. Form: Total dust</p> <p>OSHA PEL (United States, 6/2016). TWA: 5 mg/m³ 8 hours. Form: Respirable fraction TWA: 15 mg/m³ 8 hours. Form: Total dust</p> <p>None.</p>
Dimethyl sulfoxide	<p>AIHA WEEL (United States, 10/2011). TWA: 250 ppm 8 hours.</p> <p>None.</p>
Potassium chloride	<p>None.</p>
Beta Mercaptoethanol 2-Mercaptoethanol	<p>AIHA WEEL (United States, 10/2011). Absorbed through skin. TWA: 0.2 ppm 8 hours.</p>

Section 8. Exposure controls/personal protection

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

Section 9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

- | | | |
|-----------------------|--|----------------|
| Physical state | <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage | Liquid. |
| | LE392 host cells | Liquid. |
| | BL21 competent cells | Liquid. |
| | pUC 18 DNA Control Plasmid | Liquid. |
| | Beta Mercaptoethanol | Liquid. |
| Color | <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage | Not available. |
| | LE392 host cells | Not available. |
| | BL21 competent cells | Not available. |
| | pUC 18 DNA Control Plasmid | Not available. |
| | Beta Mercaptoethanol | Not available. |

Section 9. Physical and chemical properties

Odor	: Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not available. Not available. Not available. Not available. Not available.
Odor threshold	: Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not available. Not available. Not available. Not available. Not available.
pH	: Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	7.5 7 6.4 7.5 Not available.
Melting point	: Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not available. Not available. Not available. 0°C (32°F) Not available.
Boiling point	: Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not available. Not available. Not available. 100°C (212°F) Not available.
Flash point	: Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not available. Not available. Not available. Not available. Not available.
Evaporation rate	: Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not available. Not available. Not available. Not available. Not available.
Flammability (solid, gas)	: Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not applicable. Not applicable. Not applicable. Not applicable. Not applicable.
Lower and upper explosive (flammable) limits	: Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not available. Not available. Not available. Not available. Not available.
Vapor pressure	: Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not available. Not available. Not available. Not available. Not available.
Vapor density	: Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not available. Not available. Not available. Not available. Not available.





Section 9. Physical and chemical properties

Relative density	: <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not available. Not available. Not available. Not available. Not available.
Solubility	: <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Easily soluble in the following materials: cold water and hot water. Easily soluble in the following materials: cold water and hot water. Soluble in the following materials: cold water and hot water. Easily soluble in the following materials: cold water and hot water. Easily soluble in the following materials: cold water and hot water.
Partition coefficient: n-octanol/water	: <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not available. Not available. Not available. Not available. Not available.
Auto-ignition temperature	: <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not available. Not available. Not available. Not available. Not available.
Decomposition temperature	: <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not available. Not available. Not available. Not available. Not available.
Viscosity	: <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not available. Not available. Not available. Not available. Not available.

Section 10. Stability and reactivity

10.1 Reactivity	: <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	No specific test data related to reactivity available for this product or its ingredients. No specific test data related to reactivity available for this product or its ingredients. No specific test data related to reactivity available for this product or its ingredients. No specific test data related to reactivity available for this product or its ingredients. No specific test data related to reactivity available for this product or its ingredients.
10.2 Chemical stability	: <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	The product is stable. The product is stable. The product is stable. The product is stable. The product is stable.

Section 10. Stability and reactivity

10.3 Possibility of hazardous reactions	:  Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous reactions will not occur.
10.4 Conditions to avoid	:  Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	No specific data. No specific data. No specific data. No specific data. No specific data.
10.5 Incompatible materials	:  Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	May react or be incompatible with oxidizing materials. May react or be incompatible with oxidizing materials. May react or be incompatible with oxidizing materials. May react or be incompatible with oxidizing materials. May react or be incompatible with oxidizing materials.
10.6 Hazardous decomposition products	:  Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Under normal conditions of storage and use, hazardous decomposition products should not be produced. Under normal conditions of storage and use, hazardous decomposition products should not be produced. Under normal conditions of storage and use, hazardous decomposition products should not be produced. Under normal conditions of storage and use, hazardous decomposition products should not be produced. Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Section 11. Toxicological information

Product/ingredient name	Result	Species	Dose	Exposure
Lambda CE6 Bacteriophage				
Dimethyl sulfoxide	LD50 Dermal	Rat	40000 mg/kg	-
	LD50 Oral	Rat	14500 mg/kg	-
Trichloromethane	LC50 Inhalation Vapor	Rat	47702 mg/m ³	4 hours
	LD50 Dermal	Rabbit	>20 g/kg	-
	LD50 Oral	Rat	300 mg/kg	-
LE392 host cells				
Glycerol	LD50 Oral	Rat	12600 mg/kg	-
Sodium chloride	LD50 Oral	Rat	3000 mg/kg	-
BL21 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	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Lambda CE6 Bacteriophage					
Dimethyl sulfoxide	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Eyes - Mild irritant	Rabbit	-	100 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	100 milligrams	-
Trichloromethane	Eyes - Moderate irritant	Rabbit	-	24 hours 20 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
LE392 host cells					
Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
Sodium chloride	Eyes - Moderate irritant	Rabbit	-	24 hours 100 milligrams	-
	Eyes - Moderate irritant	Rabbit	-	10 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
BL21 competent cells					
Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
Dimethyl sulfoxide	Eyes - Mild irritant	Rabbit	-	24 hours 500 milligrams	-
	Eyes - Mild irritant	Rabbit	-	100 milligrams	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 milligrams	-

Section 11. Toxicological information

Potassium chloride	Skin - Mild irritant	Rabbit	-	milligrams 100	-
	Eyes - Mild irritant	Rabbit	-	milligrams 24 hours 500 milligrams	-
Beta Mercaptoethanol 2-Mercaptoethanol	Eyes - Severe irritant	Rabbit	-	2 milligrams	-

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Classification

Product/ingredient name	OSHA	IARC	NTP
Lambda CE6 Bacteriophage Trichloromethane	-	2B	Reasonably anticipated to be a human carcinogen.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Lambda CE6 Bacteriophage Trichloromethane	Category 3	Not applicable.	Respiratory tract irritation and Narcotic effects
Beta Mercaptoethanol 2-Mercaptoethanol	Category 3	Not applicable.	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
Lambda CE6 Bacteriophage Trichloromethane	Category 1	Not determined	kidneys and liver



Aspiration hazard

Not available.

Section 11. Toxicological information

Information on the likely routes of exposure	: <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Routes of entry anticipated: Oral, Dermal, Inhalation. Routes of entry anticipated: Oral, Dermal, Inhalation. Routes of entry anticipated: Oral, Dermal, Inhalation. Not available. Routes of entry anticipated: Oral, Dermal, Inhalation.
<u>Potential acute health effects</u>		
Eye contact	: <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Causes serious eye irritation. Causes serious eye irritation. Causes eye irritation. No known significant effects or critical hazards. Causes serious eye damage.
Inhalation	: <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta 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. Harmful if inhaled.
Skin contact	: <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta 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. Harmful in contact with skin. Causes skin irritation. May cause an allergic skin reaction.
Ingestion	: <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta 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.
<u>Symptoms related to the physical, chemical and toxicological characteristics</u>		
Eye contact	: <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Adverse symptoms may include the following: pain or irritation watering redness Adverse symptoms may include the following: pain or irritation watering redness Adverse symptoms may include the following: irritation watering redness No specific data. Adverse symptoms may include the following: pain watering redness
Inhalation	: <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid	Adverse symptoms may include the following: reduced fetal weight increase in fetal deaths skeletal malformations No specific data. No specific data. No specific data.

Section 11. Toxicological information

Skin contact	Beta Mercaptoethanol	No specific data.
	:  Lambda CE6 Bacteriophage	Adverse symptoms may include the following: reduced fetal weight increase in fetal deaths skeletal malformations
Ingestion	LE392 host cells	No specific data.
	:  Lambda CE6 Bacteriophage	Adverse symptoms may include the following: reduced fetal weight increase in fetal deaths skeletal malformations
	BL21 competent cells	No specific data.
	pUC 18 DNA Control Plasmid	No specific data.
	Beta Mercaptoethanol	Adverse symptoms may include the following: pain or irritation redness blistering may occur
	LE392 host cells	No specific data.
	BL21 competent cells	No specific data.
	pUC 18 DNA Control Plasmid	No specific data.
	Beta Mercaptoethanol	Adverse symptoms may include the following: stomach pains

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

Short term exposure

Potential immediate effects : Not available.




Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

General	:  Lambda CE6 Bacteriophage	Causes damage to organs through prolonged or repeated exposure.
	LE392 host cells	No known significant effects or critical hazards.
Carcinogenicity	BL21 competent cells	No known significant effects or critical hazards.
	:  Lambda CE6 Bacteriophage	Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.
Mutagenicity	LE392 host cells	No known significant effects or critical hazards.
	:  Lambda CE6 Bacteriophage	No known significant effects or critical hazards.
	BL21 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.
	LE392 host cells	No known significant effects or critical hazards.
	BL21 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.

Section 11. Toxicological information

Teratogenicity	: <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Suspected of damaging the unborn child. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards.
Developmental effects	: <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta 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.
Fertility effects	: <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta 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.

Numerical measures of toxicity

Acute toxicity estimates

Route	ATE value
<input checked="" type="checkbox"/> Lambda CE6 Bacteriophage Oral Inhalation (vapors)	16666.7 mg/kg 100 mg/l
LE392 host cells Oral	300000 mg/kg
BL21 competent cells Oral	144778.9 mg/kg
Beta Mercaptoethanol Oral Dermal Inhalation (vapors)	2440 mg/kg 2000 mg/kg 20 mg/l

Section 12. Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
<input checked="" type="checkbox"/> Lambda CE6 Bacteriophage Dimethyl sulfoxide	Acute LC50 25000 ppm Fresh water	Daphnia - Daphnia magna - Neonate	48 hours
	Acute LC50 34000000 µg/l Fresh water Chronic NOEC 100 µl/L Marine water	Fish - Pimephales promelas Algae - Ulva lactuca	96 hours 72 hours
Trichloromethane	Acute EC50 13.3 mg/l Fresh water	Algae - Chlamydomonas reinhardtii - Exponential growth phase	72 hours
	Acute EC50 2.803 mg/l Fresh water	Crustaceans - Cypris subglobosa	48 hours
	Acute LC50 29000 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 13.3 ppm Fresh water	Fish - Lepomis macrochirus	96 hours
	Chronic EC10 3.61 mg/l Fresh water	Algae - Chlamydomonas reinhardtii - Exponential growth phase	72 hours
	Chronic NOEC 1.8 mg/l Fresh water	Daphnia - Daphnia magna	21 days

Section 12. Ecological information

LE392 host cells Glycerol Sodium chloride	Acute LC50 54000 mg/l Fresh water Acute EC50 4.74 g/L Fresh water	Fish - Oncorhynchus mykiss Algae - Chlamydomonas reinhardtii	96 hours 96 hours
	Acute EC50 519.6 mg/l Fresh water Acute EC50 402600 µg/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	Crustaceans - Cypris subglobosa Daphnia - Daphnia magna Aquatic plants - Lemna minor Fish - Morone saxatilis - Larvae Crustaceans - Hyalella azteca - Juvenile (Fledgling, Hatchling, Weanling)	48 hours 48 hours 96 hours 96 hours 3 weeks
BL21 competent cells Glycerol Dimethyl sulfoxide	Acute LC50 54000 mg/l Fresh water Acute LC50 25000 ppm Fresh water	Fish - Oncorhynchus mykiss Daphnia - Daphnia magna - Neonate	96 hours 48 hours
	Acute LC50 34000000 µg/l Fresh water Chronic NOEC 100 µl/L Marine water Acute EC50 1337000 µg/l Fresh water Acute EC50 9.24 g/L Fresh water	Fish - Pimephales promelas Algae - Ulva lactuca Algae - Navicula seminulum Algae - Desmodesmus subspicatus	96 hours 72 hours 96 hours 72 hours
Potassium chloride	Acute EC50 141460 µg/l Fresh water Acute LC50 12.92 mg/l Fresh water Acute LC50 880 mg/l Fresh water	Daphnia - Daphnia magna Crustaceans - Pseudosida ramosa - Neonate Fish - Pimephales promelas	48 hours 48 hours 96 hours

12.2 Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
LE392 host cells Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-
BL21 competent cells Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-
Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability	
BL21 competent cells Potassium chloride	-	-	Readily	

12.3 Bioaccumulative potential

Section 12. Ecological information

Product/ingredient name	LogP _{ow}	BCF	Potential
Lambda CE6 Bacteriophage			
Dimethyl sulfoxide	-1.35	3.16	low
Trichloromethane	1.97	690	high
LE392 host cells			
Glycerol	-1.76	-	low
BL21 competent cells			
Glycerol	-1.76	-	low
Dimethyl sulfoxide	-1.35	3.16	low
Potassium chloride	-0.46	-	low
Beta 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.

United States - RCRA Toxic hazardous waste "U" List

Ingredient	CAS #	Status	Reference number
Lambda CE6 Bacteriophage Chloroform; Methane, trichloro-	67-66-3	Listed	U044

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.

Additional information

DOT Classification : **Reportable quantity** 1666.7 lbs / 756.67 kg. Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.

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 Annex II of MARPOL and the IBC Code : Not available.

Section 15. Regulatory information

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

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption:** Not determined
Clean Water Act (CWA) 307: Trichloromethane
Clean Water Act (CWA) 311: Trichloromethane; Edetic acid

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

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

Name	%	EHS	SARA 302 TPQ		SARA 304 RQ	
			(lbs)	(gallons)	(lbs)	(gallons)
<input checked="" type="checkbox"/> Lambda CE6 Bacteriophage Trichloromethane	≤5	Yes.	10000	803.8	10	0.8

SARA 304 RQ : 1666.7 lbs / 756.7 kg

SARA 311/312

Classification : Lambda CE6 Bacteriophage
 EYE IRRITATION - Category 2A
 CARCINOGENICITY - Category 2
 TOXIC TO REPRODUCTION (Unborn child) - Category 2
 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (kidneys, liver) - Category 1
 LE392 host cells
 EYE IRRITATION - Category 2A
 BL21 competent cells
 EYE IRRITATION - Category 2B
 pUC 18 DNA Control Plasmid
 Not applicable.
 Beta Mercaptoethanol
 ACUTE TOXICITY (dermal) - Category 4
 ACUTE TOXICITY (inhalation) - Category 4

Section 15. Regulatory information

SKIN IRRITATION - Category 2
 SERIOUS EYE DAMAGE - Category 1
 SKIN SENSITIZATION - Category 1

Composition/information on ingredients

Name	%	Classification
Lambda CE6 Bacteriophage		
Dimethyl sulfoxide	≤10	FLAMMABLE LIQUIDS - Category 4 EYE IRRITATION - Category 2A
Trichloromethane	≤5	ACUTE TOXICITY (oral) - Category 4 ACUTE TOXICITY (inhalation) - Category 3 SKIN IRRITATION - Category 2 EYE IRRITATION - Category 2A CARCINOGENICITY - Category 2 TOXIC TO REPRODUCTION (Unborn child) - Category 2 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Narcotic effects) - Category 3 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) (kidneys, liver) - Category 1
LE392 host cells		
Glycerol	≥10 - ≤25	EYE IRRITATION - Category 2A
Sodium chloride	≤3	EYE IRRITATION - Category 2A
BL21 competent cells		
Glycerol	≥10 - ≤25	EYE IRRITATION - Category 2A
Dimethyl sulfoxide	≤10	FLAMMABLE LIQUIDS - Category 4 EYE IRRITATION - Category 2A
Sucrose	≤10	COMBUSTIBLE DUSTS
Potassium chloride	≤3	EYE IRRITATION - Category 2A
Beta Mercaptoethanol		
2-Mercaptoethanol	≤12	FLAMMABLE LIQUIDS - Category 4 ACUTE TOXICITY (oral) - Category 3 ACUTE TOXICITY (dermal) - Category 2 ACUTE TOXICITY (inhalation) - Category 2 SKIN IRRITATION - Category 2 SERIOUS EYE DAMAGE - Category 1 SKIN SENSITIZATION - Category 1 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	Lambda CE6 Bacteriophage Trichloromethane	67-66-3	≤5
Supplier notification	Lambda CE6 Bacteriophage Trichloromethane	67-66-3	≤5

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.


State regulations

- Massachusetts** : The following components are listed: 2-MERCAPTOETHANOL; SUCROSE DUST; GLYCERINE MIST
- New York** : The following components are listed: Chloroform; Methane, trichloro-
- New Jersey** : The following components are listed: DIMETHYL SULFOXIDE; METHANE, SULFINYLBI-; CHLOROFORM; METHANE, TRICHLORO-; THIOGLYCOL; 2-MERCAPTOETHANOL; GLYCERIN; 1,2,3-PROPANETRIOL

Section 15. Regulatory information

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

California Prop. 65

 **WARNING:** This product can expose you to Chloroform, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Ingredient name	No significant risk level	Maximum acceptable dosage level
<input checked="" type="checkbox"/> Lambda CE6 Bacteriophage Chloroform	Yes.	-

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

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

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

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

Section 16. Other information

History

Date of issue : 12/31/2017
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Version : 5

✔ Indicates information that has changed from previously issued version.

Notice to reader

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