

SAFETY DATA SHEET



Lambda CE6 Induction Kit, Part Number 235200

Section 1. Identification

Product identifier	: 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

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

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)

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

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

Section 2. Hazard(s) identification

Classification of the substance or mixture

Lambda CE6 Bacteriophage

H351	CARCINOGENICITY - Category 2
H361	REPRODUCTIVE TOXICITY (Unborn child) - Category 2
H373	SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 2




Beta Mercaptoethanol

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

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%

GHS label elements

Section 2. Hazard(s) identification

Hazard pictograms	: Lambda CE6 Bacteriophage	
	Beta Mercaptoethanol	 
Signal word	: Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	WARNING No signal word. No signal word. No signal word. DANGER
Hazard statements	: Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	H361 - Suspected of damaging the unborn child. H351 - Suspected of causing cancer. H373 - May cause damage to organs through prolonged or repeated exposure. No known significant effects or critical hazards. No known significant effects or critical hazards. No known significant effects or critical hazards. H312 + H332 - Harmful in contact with skin or if inhaled. H318 - Causes serious eye damage. H315 - Causes skin irritation. H317 - May cause an allergic skin reaction. H412 - Harmful to aquatic life with long lasting effects.
<u>Precautionary statements</u>		
Prevention	: Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	P201 - Obtain special instructions before use. P202 - Do not handle until all safety precautions have been read and understood. P281 - Use personal protective equipment as required. P260 - Do not breathe vapour. Not applicable. Not applicable. Not applicable. P280 - Wear protective gloves. Wear eye or face protection. Wear protective clothing. P271 - Use only outdoors or in a well-ventilated area. P273 - Avoid release to the environment. P261 - Avoid breathing vapour. P264 - Wash hands thoroughly after handling. P272 - Contaminated work clothing should not be allowed out of the workplace.
Response	: Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	P314 - Get medical attention if you feel unwell. P308 + P313 - IF exposed or concerned: Get medical attention. Not applicable. Not applicable. Not applicable. P304 + P340 + P312 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. P302 + P352 + P312 + P362 + P363 - IF ON SKIN: Wash with plenty of soap and water. Call a POISON CENTER or physician if you feel unwell. Take off contaminated clothing. Wash contaminated clothing before reuse. P333 + P313 - If skin irritation or rash occurs: Get

Section 2. Hazard(s) identification

		medical attention. P305 + P351 + P338 + P310 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or physician.
Storage	: <input checked="" type="checkbox"/> 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	: <input checked="" type="checkbox"/> 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		
Additional warning phrases	: <input checked="" type="checkbox"/> Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not applicable. Not applicable. Not applicable. Not applicable.
Other hazards which do not result in classification	: <input checked="" type="checkbox"/> 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 and ingredient information

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

Ingredient name	% (w/w)	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 - ≤30	56-81-5
BL21 competent cells		
Glycerol	≥10 - ≤30	56-81-5
Dimethyl sulfoxide	≤10	67-68-5
Sucrose	≤10	57-50-1
Beta Mercaptoethanol		
2-Mercaptoethanol	≤12	60-24-2

Section 3. Composition and ingredient information

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

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. Get medical attention if irritation occurs.
	BL21 competent cells	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.
	pUC 18 DNA Control Plasmid	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. Get medical attention if symptoms occur.
	BL21 competent cells	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
	pUC 18 DNA Control Plasmid	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
	Beta Mercaptoethanol	Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person

Section 4. First aid measures

Skin contact

:  Lambda CE6 Bacteriophage	<p>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.</p> <p>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.</p>
LE392 host cells	<p>Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.</p>
BL21 competent cells	<p>Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.</p>
pUC 18 DNA Control Plasmid	<p>Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.</p>
Beta Mercaptoethanol	<p>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.</p>

Ingestion

:  Lambda CE6 Bacteriophage	<p>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.</p>
LE392 host cells	<p>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.</p>
BL21 competent cells	<p>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.</p>
pUC 18 DNA Control Plasmid	<p>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</p>

Section 4. First aid measures

Beta Mercaptoethanol

directed to do so by medical personnel. Get medical attention if symptoms occur.

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

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact	: 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. Causes serious eye damage.
Inhalation	: 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	: 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	: 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	: 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. Adverse symptoms may include the following: pain watering redness
Inhalation	: Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations No specific data. No specific data. No specific data. No specific data.

Section 4. First aid measures

Skin contact	:	Λambda CE6 Bacteriophage	Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations
		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: pain or irritation redness blistering may occur
Ingestion	:	Λambda CE6 Bacteriophage	Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations
		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

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

Notes to physician	:	Λambda CE6 Bacteriophage	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	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
		BL21 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 specialist immediately if large quantities have been ingested or inhaled.

Specific treatments	:	Λambda CE6 Bacteriophage	No specific treatment.
		LE392 host cells	No specific treatment.
		BL21 competent cells	No specific treatment.
		pUC 18 DNA Control Plasmid	No specific treatment.
		Beta Mercaptoethanol	No specific treatment.

Protection of first-aiders	:	Λambda 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.
		BL21 competent cells	No action shall be taken involving any personal risk or without suitable training.
		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.

Section 4. First aid measures

See toxicological information (Section 11)

Section 5. Firefighting measures

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.



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. 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


:	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	No specific data.
	Beta Mercaptoethanol	Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides

Section 5. Firefighting measures

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 (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.

Section 6. Accidental release measures

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 spilt material. Avoid breathing vapour 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 spilt material. 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

Section 6. Accidental release measures

		through spilt material. Put on appropriate personal protective equipment.
	pUC 18 DNA Control Plasmid	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Put on appropriate personal protective equipment.
	Beta Mercaptoethanol	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
For emergency responders :	<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>If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".</p> <p>If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".</p> <p>If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".</p> <p>If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".</p> <p>If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".</p>
Environmental precautions :	<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>Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).</p> <p>Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).</p> <p>Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).</p> <p>Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).</p> <p>Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.</p>

Section 6. Accidental release measures

Methods and material for containment and cleaning up

Methods for cleaning up	: Lambda CE6 Bacteriophage	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.
	LE392 host 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 competent cells	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
	pUC 18 DNA Control Plasmid	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
	Beta Mercaptoethanol	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Section 7. Handling and storage

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 vapour 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).
	BL21 competent cells	Put on appropriate personal protective equipment (see Section 8).
	pUC 18 DNA Control Plasmid	Put on appropriate personal protective equipment (see Section 8).
	Beta Mercaptoethanol	Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not ingest. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is

Section 7. Handling and storage

Advice on general occupational hygiene

: Lambda CE6 Bacteriophage

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.

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.

LE392 host 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 competent cells

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

pUC 18 DNA Control Plasmid

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

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.

Conditions for safe storage, including any incompatibilities

: Lambda CE6 Bacteriophage

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

LE392 host cells

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

Section 7. Handling and storage

BL21 competent cells

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

pUC 18 DNA Control Plasmid

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

Beta Mercaptoethanol

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

Section 8. Exposure controls and personal protection

[Control parameters](#)

[Occupational exposure limits](#)

Ingredient name	Exposure limits
Lambda CE6 Bacteriophage Dimethyl sulfoxide	DFG MAC-values list (Germany, 7/2015). Absorbed through skin. PEAK: 320 mg/m ³ , 4 times per shift, 15 minutes. TWA: 160 mg/m ³ 8 hours. PEAK: 100 ppm, 4 times per shift, 15 minutes. TWA: 50 ppm 8 hours.
Trichloromethane	Safe Work Australia (Australia, 1/2014). Absorbed through skin. TWA: 10 mg/m ³ 8 hours. TWA: 2 ppm 8 hours.
LE392 host cells Glycerol	Safe Work Australia (Australia, 1/2014). TWA: 10 mg/m ³ 8 hours.
BL21 competent cells Glycerol	Safe Work Australia (Australia, 1/2014).

Section 8. Exposure controls and personal protection

Dimethyl sulfoxide

TWA: 10 mg/m³ 8 hours.
DFG MAC-values list (Germany, 7/2015).
Absorbed through skin.

PEAK: 320 mg/m³, 4 times per shift, 15 minutes.

TWA: 160 mg/m³ 8 hours.

PEAK: 100 ppm, 4 times per shift, 15 minutes.

TWA: 50 ppm 8 hours.

Sucrose

Safe Work Australia (Australia, 1/2014).
 TWA: 10 mg/m³ 8 hours.

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

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

Appearance

Physical state	:	<ul style="list-style-type: none"> Lambda CE6 Bacteriophage Liquid. LE392 host cells Liquid. BL21 competent cells Liquid. pUC 18 DNA Control Plasmid Liquid. Beta Mercaptoethanol Liquid.
Colour	:	<ul style="list-style-type: none"> 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.
Odour	:	<ul style="list-style-type: none"> 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.
Odour threshold	:	<ul style="list-style-type: none"> 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.
pH	:	<ul style="list-style-type: none"> Lambda CE6 Bacteriophage 7.5 LE392 host cells 7 BL21 competent cells 6.4 pUC 18 DNA Control Plasmid 7.5 Beta Mercaptoethanol Not available.
Melting point	:	<ul style="list-style-type: none"> Lambda CE6 Bacteriophage Not available. LE392 host cells Not available. BL21 competent cells Not available. pUC 18 DNA Control Plasmid 0°C (32°F) Beta Mercaptoethanol Not available.
Boiling point	:	<ul style="list-style-type: none"> Lambda CE6 Bacteriophage Not available. LE392 host cells Not available. BL21 competent cells Not available. pUC 18 DNA Control Plasmid 100°C (212°F) Beta Mercaptoethanol Not available.
Flash point	:	<ul style="list-style-type: none"> 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.
Evaporation rate	:	<ul style="list-style-type: none"> 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.
Flammability (solid, gas)	:	<ul style="list-style-type: none"> 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.
Lower and upper explosive (flammable) limits	:	<ul style="list-style-type: none"> 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

Vapour pressure	:	<ul style="list-style-type: none"> 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.
Vapour density	:	<ul style="list-style-type: none"> 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.
Relative density	:	<ul style="list-style-type: none"> 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.
Solubility	:	<ul style="list-style-type: none"> Lambda CE6 Bacteriophage Easily soluble in the following materials: cold water and hot water. LE392 host cells Easily soluble in the following materials: cold water and hot water. BL21 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.
Partition coefficient: n-octanol/water	:	<ul style="list-style-type: none"> 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.
Auto-ignition temperature	:	<ul style="list-style-type: none"> 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.
Decomposition temperature	:	<ul style="list-style-type: none"> 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.
Viscosity	:	<ul style="list-style-type: none"> 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 10. Stability and reactivity

Reactivity	:	<ul style="list-style-type: none"> Lambda CE6 Bacteriophage No specific test data related to reactivity available for this product or its ingredients. LE392 host cells No specific test data related to reactivity available for this product or its ingredients. BL21 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.
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Section 10. Stability and reactivity

Chemical stability	:  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.
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.
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.
Incompatible materials	:  Lambda CE6 Bacteriophage LE392 host cells BL21 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	May react or be incompatible with oxidising materials. May react or be incompatible with oxidising materials. May react or be incompatible with oxidising materials. May react or be incompatible with oxidising materials. May react or be incompatible with oxidising materials.
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

Information on toxicological effects

Acute toxicity

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 Vapour	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	-

Section 11. Toxicological information

BL21 competent cells Glycerol	LD50 Oral	Rat	12600 mg/kg	-
Dimethyl sulfoxide	LD50 Dermal	Rat	40000 mg/kg	-
	LD50 Oral	Rat	14500 mg/kg	-
Sucrose	LD50 Oral	Rat	29700 mg/kg	-
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	-
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	-
	Skin - Mild irritant	Rabbit	-	100 milligrams	-
Beta Mercaptoethanol 2-Mercaptoethanol	Eyes - Severe irritant	Rabbit	-	2 milligrams	-

Sensitisation

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Reproductive toxicity

Not available.

Teratogenicity

Section 11. Toxicological information

Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
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	Not determined

Aspiration hazard

Not available.

Information on likely routes of exposure :

- ▶ 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.

Potential acute health effects

Eye contact :

- ▶ 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.
 Causes serious eye damage.

Inhalation :

- ▶ 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 :

- ▶ 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 :

- ▶ 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.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact :

- ▶ 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.
 Adverse symptoms may include the following:
 pain
 watering
 redness

Section 11. Toxicological information

Inhalation	: Λ ambda CE6 Bacteriophage	Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations
	LE392 host cells	No specific data.
	BL21 competent cells	No specific data.
	pUC 18 DNA Control Plasmid	No specific data.
	Beta Mercaptoethanol	No specific data.
Skin contact	: Λ ambda CE6 Bacteriophage	Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations
	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: pain or irritation redness blistering may occur
Ingestion	: Λ ambda CE6 Bacteriophage	Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations
	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 as well as chronic effects from short and long-term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General	: Λ ambda CE6 Bacteriophage	May cause damage to organs through prolonged or repeated exposure.
	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	Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
Carcinogenicity	: Λ ambda CE6 Bacteriophage	Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.
	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.
Mutagenicity	: Λ ambda CE6 Bacteriophage	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	: 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	: 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	: 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
Lambda CE6 Bacteriophage Oral Inhalation (vapours)	16666.7 mg/kg 100 mg/l
Beta Mercaptoethanol Oral Dermal Inhalation (vapours)	2440 mg/kg 2000 mg/kg 20 mg/l

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Lambda CE6 Bacteriophage 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 µl/L Marine water	Algae - Ulva lactuca	72 hours
	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 Chronic EC10 3.61 mg/l Fresh water	Fish - Lepomis macrochirus Algae - Chlamydomonas reinhardtii - Exponential growth phase	96 hours 72 hours
Chronic NOEC 1.8 mg/l Fresh water	Daphnia - Daphnia magna	21 days	
LE392 host cells Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
BL21 competent cells Glycerol Dimethyl sulfoxide	Acute LC50 54000 mg/l Fresh water	Fish - Oncorhynchus mykiss	96 hours
	Acute LC50 25000 ppm Fresh water	Daphnia - Daphnia magna - Neonate	48 hours

Section 12. Ecological information

	Acute LC50 34000000 µg/l Fresh water Chronic NOEC 100 µl/L Marine water	Fish - Pimephales promelas Algae - Ulva lactuca	96 hours 72 hours
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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	-	-

Bioaccumulative potential

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
Sucrose	-3.7	-	low
Beta Mercaptoethanol 2-Mercaptoethanol	-0.056	-	low

Mobility in soil

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

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

Section 13. Disposal considerations

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

Section 14. Transport information

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

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

Transport in bulk according to Annex II of Marpol and the IBC Code : Not available.

Section 15. Regulatory information

Standard Uniform Schedule of Medicine and Poisons

6

Model Work Health and Safety Regulations - Scheduled Substances

No listed substance

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

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

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

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

Section 16. Any other relevant information

History

Date of issue/Date of revision : 31/12/2017

Date of previous issue : 28/10/2015.

Version : 3.02

Key to abbreviations : ADG = Australian Dangerous Goods
 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)
 NOHSC = National Occupational Health and Safety Commission
 SUSMP = Standard Uniform Schedule of Medicine and Poisons
 UN = United Nations

Procedure used to derive the classification

Classification	Justification
<p>Lambda CE6 Bacteriophage Carc. 2, H351 Repr. 2, H361 (Unborn child) STOT RE 2, H373</p> <p>Beta Mercaptoethanol Acute Tox. 4, H312 Acute Tox. 4, H332 Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Chronic 3, H412</p>	<p>Calculation method Calculation method Calculation method</p> <p>Calculation method Calculation method Calculation method Calculation method Calculation method Calculation method</p>

References : Not available.

Indicates information that has changed from previously issued version.

Notice to reader

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