SAFETY DATA SHEET

Agilent Technologies

TKB1 Competent Cells, Part Number 200134

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

1.1 Product identifier

Product name : TKB1 Competent Cells, Part Number 200134

Part no. (chemical kit) : 200134

Part no. :

TKB1 Competent Cells	200134-41
pUC 18 DNA Control Plasmid	200231-42
Beta Mercaptoethanol	210200-43

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

Identified uses : Analytical reagent.

TKB1 Competent Cells	1 ml (5 x 0.2 ml)
pUC 18 DNA Control Plasmid	0.01 ml (0.1 ng / µl)
Beta Mercaptoethanol	0.025 ml (25 µl 1.42M)

Uses advised against : None known.

1.3 Details of the supplier of the safety data sheet

Agilent Technologies Deutschland GmbH
Hewlett-Packard-Str. 8
76337 Waldbronn
Germany
0800 603 1000

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

1.4 Emergency telephone number

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

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition :

TKB1 Competent Cells	Mixture
pUC 18 DNA Control Plasmid	Mixture
Beta Mercaptoethanol	Mixture

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

Beta Mercaptoethanol

H312	ACUTE TOXICITY (dermal)	Category 4
H315	SKIN CORROSION/IRRITATION	Category 2
H318	SERIOUS EYE DAMAGE/EYE IRRITATION	Category 1
H317	SKIN SENSITISATION	Category 1
H361f	REPRODUCTIVE TOXICITY	Category 2
H373	SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE	Category 2
H412	LONG-TERM (CHRONIC) AQUATIC HAZARD	Category 3

TKB1 Competent Cells	The product is not classified as hazardous according to Regulation (EC) 1272/2008 as amended.
pUC 18 DNA Control Plasmid	The product is not classified as hazardous according to Regulation (EC) 1272/2008 as amended.
Beta Mercaptoethanol	The product is classified as hazardous according to Regulation (EC) 1272/2008 as amended.

SECTION 2: Hazards identification

Ingredients of unknown toxicity	:	TKB1 Competent Cells	Percentage of the mixture consisting of ingredient(s) of unknown acute dermal toxicity: 1 - 10% Percentage of the mixture consisting of ingredient(s) of unknown acute inhalation toxicity: 10 - 30%
Ingredients of unknown ecotoxicity	:	TKB1 Competent Cells	Contains 5% of components with unknown hazards to the aquatic environment

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

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

2.2 Label elements

Hazard pictograms : Beta Mercaptoethanol

Signal word	:	TKB1 Competent Cells	No signal word.
		pUC 18 DNA Control Plasmid	No signal word.
		Beta Mercaptoethanol	Danger
Hazard statements	:	TKB1 Competent Cells	No known significant effects or critical hazards.
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
		Beta Mercaptoethanol	H312 - Harmful in contact with skin. H315 - Causes skin irritation. H317 - May cause an allergic skin reaction. H318 - Causes serious eye damage. H361f - Suspected of damaging fertility. H373 - May cause damage to organs through prolonged or repeated exposure. H412 - Harmful to aquatic life with long lasting effects.

Precautionary statements

Prevention	:	TKB1 Competent Cells	Not applicable.
		pUC 18 DNA Control Plasmid	Not applicable.
		Beta Mercaptoethanol	P201 - Obtain special instructions before use. P280 - Wear protective gloves, protective clothing and eye or face protection. P260 - Do not breathe vapour.
Response	:	TKB1 Competent Cells	Not applicable.
		pUC 18 DNA Control Plasmid	Not applicable.
		Beta Mercaptoethanol	P305 + P351 + P338, P310 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor.
Storage	:	TKB1 Competent Cells	Not applicable.
		pUC 18 DNA Control Plasmid	Not applicable.
		Beta Mercaptoethanol	Not applicable.
Disposal	:	TKB1 Competent Cells	Not applicable.
		pUC 18 DNA Control Plasmid	Not applicable.
		Beta Mercaptoethanol	P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
Hazardous ingredients	:	Beta Mercaptoethanol	- 2-Mercaptoethanol

SECTION 2: Hazards identification

Supplemental label elements

: TKB1 Competent Cells — Not applicable.
pUC 18 DNA Control Plasmid — Not applicable.
Beta Mercaptoethanol — Not applicable.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

: TKB1 Competent Cells — Not applicable.
pUC 18 DNA Control Plasmid — Not applicable.
Beta Mercaptoethanol — Not applicable.

Special packaging requirements

Tactile warning of danger

: TKB1 Competent Cells — Not applicable.
pUC 18 DNA Control Plasmid — Not applicable.
Beta Mercaptoethanol — Not applicable.

2.3 Other hazards

Product meets the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII

: TKB1 Competent Cells — This mixture does not contain any substances that are assessed to be a PBT or a vPvB.
pUC 18 DNA Control Plasmid — This mixture does not contain any substances that are assessed to be a PBT or a vPvB.
Beta Mercaptoethanol — This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

Other hazards which do not result in classification

: TKB1 Competent Cells — None known.
pUC 18 DNA Control Plasmid — None known.
Beta Mercaptoethanol — None known.

SECTION 3: Composition/information on ingredients

3.1 Substances

: TKB1 Competent Cells — Mixture
pUC 18 DNA Control Plasmid — Mixture
Beta Mercaptoethanol — Mixture

Product/ingredient name	Identifiers	%	Classification	Specific Conc. Limits, M-factors and ATEs	Type
TKB1 Competent Cells					
Glycerol	REACH #: Annex V EC: 200-289-5 CAS: 56-81-5	≥10 - ≤25	Not classified.	-	[1]
Sucrose	REACH #: Annex IV EC: 200-334-9 CAS: 57-50-1	≤10	Not classified.	-	[1]
Beta Mercaptoethanol					
2-Mercaptoethanol	EC: 200-464-6 CAS: 60-24-2	≤12	Acute Tox. 3, H301 Acute Tox. 2, H310 Acute Tox. 3, H331 Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1A, H317 Repr. 2, H361f STOT RE 2, H373 (heart, liver) (oral) Aquatic Acute 1, H400 Aquatic Chronic 2, H411	ATE [Oral] = 244 mg/kg ATE [Dermal] = 200 mg/kg ATE [Inhalation (vapours)] = 3 mg/l STOT RE 2, H373: C ≥ 10% M [Acute] = 1	[1]

SECTION 3: Composition/information on ingredients

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

There are no additional ingredients present which, within the current knowledge of the supplier, are classified and contribute to the classification of the substance and hence require reporting in this section.

Type

TKB1 Competent Cells	[1] Substance with a workplace exposure limit
Beta Mercaptoethanol	[1] Substance classified with a health or environmental hazard

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

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact

TKB1 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

TKB1 Competent Cells	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
pUC 18 DNA Control Plasmid	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
Beta Mercaptoethanol	Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Skin contact

TKB1 Competent Cells	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
pUC 18 DNA Control Plasmid	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
Beta Mercaptoethanol	Get medical attention immediately. Call a poison center or physician. Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

SECTION 4: First aid measures

Ingestion	:	TKB1 Competent Cells	Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
		pUC 18 DNA Control Plasmid	Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
		Beta Mercaptoethanol	Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
Protection of first-aiders	:	TKB1 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.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

Eye contact	:	TKB1 Competent Cells	No known significant effects or critical hazards.
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
		Beta Mercaptoethanol	Causes serious eye damage.
Inhalation	:	TKB1 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.
Skin contact	:	TKB1 Competent Cells	No known significant effects or critical hazards.
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
		Beta Mercaptoethanol	Harmful in contact with skin. Causes skin irritation. May cause an allergic skin reaction.
Ingestion	:	TKB1 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.

Over-exposure signs/symptoms

SECTION 4: First aid measures

Eye contact	:	TKB1 Competent Cells	No specific data.
		pUC 18 DNA Control Plasmid	No specific data.
		Beta Mercaptoethanol	Adverse symptoms may include the following: pain watering redness
Inhalation	:	TKB1 Competent Cells	No specific data.
		pUC 18 DNA Control Plasmid	No specific data.
		Beta Mercaptoethanol	Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations
Skin contact	:	TKB1 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 reduced foetal weight increase in foetal deaths skeletal malformations
Ingestion	:	TKB1 Competent Cells	No specific data.
		pUC 18 DNA Control Plasmid	No specific data.
		Beta Mercaptoethanol	Adverse symptoms may include the following: stomach pains reduced foetal weight increase in foetal deaths skeletal malformations

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician	:	TKB1 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	:	TKB1 Competent Cells	No specific treatment.
		pUC 18 DNA Control Plasmid	No specific treatment.
		Beta Mercaptoethanol	No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	:	TKB1 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	:	TKB1 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

SECTION 5: Firefighting measures

Hazards from the substance or mixture	: TKB1 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 combustion products	: TKB1 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

5.3 Advice for firefighters

Special precautions for fire-fighters	: TKB1 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	: TKB1 Competent Cells	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
	pUC 18 DNA Control Plasmid	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
	Beta Mercaptoethanol	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	: TKB1 Competent Cells	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Put on appropriate personal protective equipment.
	pUC 18 DNA Control Plasmid	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas.

SECTION 6: Accidental release measures

			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	:	TKB1 Competent Cells	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
		pUC 18 DNA Control Plasmid	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
		Beta Mercaptoethanol	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
6.2 Environmental precautions	:	TKB1 Competent Cells	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
		pUC 18 DNA Control Plasmid	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
		Beta Mercaptoethanol	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up	:	TKB1 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.

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

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Protective measures	:	TKB1 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. Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
Advice on general occupational hygiene	:	TKB1 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.

7.2 Conditions for safe storage, including any incompatibilities

Storage	:	TKB1 Competent Cells	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
		pUC 18 DNA Control Plasmid	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

SECTION 7: Handling and storage

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.

7.3 Specific end use(s)

Recommendations	: TKB1 Competent Cells	Industrial applications, Professional applications.
	pUC 18 DNA Control Plasmid	Industrial applications, Professional applications.
	Beta Mercaptoethanol	Industrial applications, Professional applications.
Industrial sector specific solutions	: TKB1 Competent Cells	Not available.
	pUC 18 DNA Control Plasmid	Not available.
	Beta Mercaptoethanol	Not available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
TKB1 Competent Cells	
Glycerol	**NAOSH (Ireland, 5/2021). Notes: Advisory Occupational Exposure Limit Values (OELVs)** OELV-8hr: 10 mg/m³ 8 hours. Form: mist
Sucrose	**NAOSH (Ireland, 5/2021). Notes: Advisory Occupational Exposure Limit Values (OELVs)** OELV-8hr: 10 mg/m³ 8 hours. OELV-15min: 20 mg/m³ 15 minutes.

Biological exposure indices

None known.

Recommended monitoring procedures : Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs

Product/ingredient name	Type	Exposure	Value	Population	Effects
Beta Mercaptoethanol					
2-Mercaptoethanol	DNEL	Short term Oral	0.025 mg/kg bw/day	General population	Systemic
	DNEL	Long term Oral	0.025 mg/kg bw/day	General population	Systemic
	DNEL	Short term Dermal	0.05 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Dermal	0.05 mg/kg bw/day	Workers	Systemic
	DNEL	Short term Inhalation	0.17 mg/m³	Workers	Systemic

SECTION 8: Exposure controls/personal protection

	DNEL	Long term Inhalation	0.17 mg/m³	Workers	Systemic

PNECs

No PNECs available

8.2 Exposure controls

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

Individual protection measures

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

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

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

SECTION 9: Physical and chemical properties

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

9.1 Information on basic physical and chemical properties

Appearance

Physical state :	TKB1 Competent Cells	Liquid.
	pUC 18 DNA Control Plasmid	Liquid.
	Beta Mercaptoethanol	Liquid.
Colour :	TKB1 Competent Cells	Not available.
	pUC 18 DNA Control Plasmid	Not available.
	Beta Mercaptoethanol	Not available.

SECTION 9: Physical and chemical properties

Odour :

TKB1 Competent Cells	Not available.
pUC 18 DNA Control Plasmid	Not available.
Beta Mercaptoethanol	Not available.

Odour threshold :

TKB1 Competent Cells	Not available.
pUC 18 DNA Control Plasmid	Not available.
Beta Mercaptoethanol	Not available.

Melting point/freezing point :

TKB1 Competent Cells	Not available.
pUC 18 DNA Control Plasmid	0°C
Beta Mercaptoethanol	Not available.

Initial boiling point and boiling range :

TKB1 Competent Cells	Not available.
pUC 18 DNA Control Plasmid	100°C
Beta Mercaptoethanol	Not available.

Flammability :

TKB1 Competent Cells	Not applicable.
pUC 18 DNA Control Plasmid	Not applicable.
Beta Mercaptoethanol	Not applicable.

Upper/lower flammability or explosive limits :

TKB1 Competent Cells	Not available.
pUC 18 DNA Control Plasmid	Not available.
Beta Mercaptoethanol	Not available.

Flash point :

Ingredient name	Closed cup °C	Closed cup Method	Open cup °C	Open cup Method
TKB1 Competent Cells				
Dimethyl sulfoxide	87	ASTM D 93	87	
Glycerol			177	
Beta Mercaptoethanol				
2-Mercaptoethanol	74		74	

Auto-ignition temperature :

Ingredient name	°C	Method
TKB1 Competent Cells		
Dimethyl sulfoxide	300 to 302	
Glycerol	370	
Beta Mercaptoethanol		
2-Mercaptoethanol	295	

Decomposition temperature :

TKB1 Competent Cells	Not available.
pUC 18 DNA Control Plasmid	Not available.
Beta Mercaptoethanol	Not available.

pH :

TKB1 Competent Cells	6.4
pUC 18 DNA Control Plasmid	7.5
Beta Mercaptoethanol	Not available.

Viscosity :

TKB1 Competent Cells	Not available.
pUC 18 DNA Control Plasmid	Not available.
Beta Mercaptoethanol	Not available.

SECTION 9: Physical and chemical properties

Solubility(ies) :

Media	Result
TKB1 Competent Cells	
water	Soluble
pUC 18 DNA Control Plasmid	
water	Soluble
Beta Mercaptoethanol	
water	Soluble

Partition coefficient: n-octanol/water :

TKB1 Competent Cells	Not applicable.
pUC 18 DNA Control Plasmid	Not applicable.
Beta Mercaptoethanol	Not applicable.

Vapour pressure :

Ingredient name	Vapour Pressure at 20˚C			Vapour pressure at 50˚C		
	mm Hg	kPa	Method	mm Hg	kPa	Method
TKB1 Competent Cells						
water	23.8	3.2		92.258	12.3	
Dimethyl sulfoxide	0.42	0.056	EU A.4			
pUC 18 DNA Control Plasmid						
water	23.8	3.2		92.258	12.3	
Beta Mercaptoethanol						
water	23.8	3.2		92.258	12.3	
2-Mercaptoethanol	0.98	0.13				

Evaporation rate :

TKB1 Competent Cells	Not available.
pUC 18 DNA Control Plasmid	Not available.
Beta Mercaptoethanol	Not available.

Relative density :

TKB1 Competent Cells	Not available.
pUC 18 DNA Control Plasmid	Not available.
Beta Mercaptoethanol	Not available.

Vapour density :

TKB1 Competent Cells	Not available.
pUC 18 DNA Control Plasmid	Not available.
Beta Mercaptoethanol	Not available.

Explosive properties :

TKB1 Competent Cells	Not available.
pUC 18 DNA Control Plasmid	Not available.
Beta Mercaptoethanol	Not available.

Oxidising properties :

TKB1 Competent Cells	Not available.
pUC 18 DNA Control Plasmid	Not available.
Beta Mercaptoethanol	Not available.

Particle characteristics

SECTION 9: Physical and chemical properties

Median particle size	:	TKB1 Competent Cells	Not applicable.
		pUC 18 DNA Control Plasmid	Not applicable.
		Beta Mercaptoethanol	Not applicable.

9.2 Other information

No additional information.

SECTION 10: Stability and reactivity

10.1 Reactivity	:	TKB1 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.
10.2 Chemical stability	:	TKB1 Competent Cells	The product is stable.
		pUC 18 DNA Control Plasmid	The product is stable.
		Beta Mercaptoethanol	The product is stable.
10.3 Possibility of hazardous reactions	:	TKB1 Competent Cells	Under normal conditions of storage and use, hazardous reactions will not occur.
		pUC 18 DNA Control Plasmid	Under normal conditions of storage and use, hazardous reactions will not occur.
		Beta Mercaptoethanol	Under normal conditions of storage and use, hazardous reactions will not occur.
10.4 Conditions to avoid	:	TKB1 Competent Cells	No specific data.
		pUC 18 DNA Control Plasmid	No specific data.
		Beta Mercaptoethanol	No specific data.
10.5 Incompatible materials	:	TKB1 Competent Cells	May react or be incompatible with oxidising materials.
		pUC 18 DNA Control Plasmid	May react or be incompatible with oxidising materials.
		Beta Mercaptoethanol	May react or be incompatible with oxidising materials.
10.6 Hazardous decomposition products	:	TKB1 Competent Cells	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
		pUC 18 DNA Control Plasmid	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
		Beta Mercaptoethanol	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Beta Mercaptoethanol 2-Mercaptoethanol	LD50 Oral	Rat	244 mg/kg	-

Acute toxicity estimates

SECTION 11: Toxicological information

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapours) (mg/l)	Inhalation (dusts and mists) (mg/l)
Beta Mercaptoethanol					
Beta Mercaptoethanol	2440.0	2000	N/A	30	N/A
2-Mercaptoethanol	244	200	N/A	3	N/A

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Beta Mercaptoethanol					
2-Mercaptoethanol	Eyes - Severe irritant	Rabbit	-	2 mg	-

Sensitiser

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Product/ingredient name	Category	Route of exposure	Target organs
Beta Mercaptoethanol			
2-Mercaptoethanol	Category 2	oral	heart, liver

Aspiration hazard

Not available.

Information on likely routes of exposure :

TKB1 Competent Cells	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
pUC 18 DNA Control Plasmid	Not available.
Beta Mercaptoethanol	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.

Potential acute health effects

Inhalation :

TKB1 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.

Ingestion :

TKB1 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.

Skin contact :

TKB1 Competent Cells	No known significant effects or critical hazards.
pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
Beta Mercaptoethanol	Harmful in contact with skin. Causes skin irritation. May cause an allergic skin reaction.

SECTION 11: Toxicological information

Eye contact	:	TKB1 Competent Cells	No known significant effects or critical hazards.
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
		Beta Mercaptoethanol	Causes serious eye damage.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation	:	TKB1 Competent Cells	No specific data.
		pUC 18 DNA Control Plasmid	No specific data.
		Beta Mercaptoethanol	Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations
Ingestion	:	TKB1 Competent Cells	No specific data.
		pUC 18 DNA Control Plasmid	No specific data.
		Beta Mercaptoethanol	Adverse symptoms may include the following: stomach pains reduced foetal weight increase in foetal deaths skeletal malformations
Skin contact	:	TKB1 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 reduced foetal weight increase in foetal deaths skeletal malformations
Eye contact	:	TKB1 Competent Cells	No specific data.
		pUC 18 DNA Control Plasmid	No specific data.
		Beta Mercaptoethanol	Adverse symptoms may include the following: pain watering redness

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

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

General	:	TKB1 Competent Cells	No known significant effects or critical hazards.
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
		Beta Mercaptoethanol	May cause damage to organs through prolonged or repeated exposure. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

SECTION 11: Toxicological information

Carcinogenicity	:	TKB1 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	:	TKB1 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.
Reproductive toxicity	:	TKB1 Competent Cells	No known significant effects or critical hazards.
		pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
		Beta Mercaptoethanol	Suspected of damaging fertility.

11.2 Information on other hazards

11.2.1 Endocrine disrupting properties

Not available.

11.2.2 Other information

Not available.

SECTION 12: Ecological information

12.1 Toxicity

Conclusion/Summary : Not available.

12.2 Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
Beta Mercaptoethanol 2-Mercaptoethanol	OECD 310 Ready Biodegradability - CO2 in Sealed Vessels (Headspace Test)	69 % - Not readily - 60 days	20 mg/l	-

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Beta Mercaptoethanol 2-Mercaptoethanol	-	-	Not readily

12.3 Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
Beta Mercaptoethanol 2-Mercaptoethanol	-0.056	-	low

12.4 Mobility in soil

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

Mobility : Not available.

12.5 Results of PBT and vPvB assessment

This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

12.6 Endocrine disrupting properties

SECTION 12: Ecological information

Not available.

12.7 Other adverse effects

No known significant effects or critical hazards.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.

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

Packaging

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Special precautions : This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

	ADR/RID	IMDG	IATA
14.1 UN number or ID number	Not regulated.	Not regulated.	Not regulated.
14.2 UN proper shipping name	-	-	-
14.3 Transport hazard class(es)	-	-	-
14.4 Packing group	-	-	-
14.5 Environmental hazards	No.	No.	No.

Additional information

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

14.7 Transport in bulk according to IMO instruments : Not available.

SECTION 15: Regulatory information

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

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Not listed.

Label	:	TKB1 Competent Cells	Not applicable.
		pUC 18 DNA Control Plasmid	Not applicable.
		Beta Mercaptoethanol	Not applicable.

Other EU regulations

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

Ozone depleting substances (1005/2009/EU)

Not listed.

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

Not listed.

Persistent Organic Pollutants

Not listed.

Seveso Directive

This product is not controlled under the Seveso Directive.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

Australia	:	All components are listed or exempted.
Canada	:	All components are listed or exempted.
China	:	Not determined.
Eurasian Economic Union	:	**Russian Federation inventory**: All components are listed or exempted.
Japan	:	**Japan inventory (CSCL)**: Not determined. **Japan inventory (ISHL)**: All components are listed or exempted.
New Zealand	:	Not determined.
Philippines	:	Not determined.

SECTION 15: Regulatory information

Republic of Korea : All components are listed or exempted.

Taiwan : All components are listed or exempted.

Thailand : Not determined.

Turkey : Not determined.

United States : All components are active or exempted.

Viet Nam : All components are listed or exempted.

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

SECTION 16: Other information

Indicates information that has changed from previously issued version.

Abbreviations and acronyms : ATE = Acute Toxicity Estimate
CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
EUH statement = CLP-specific Hazard statement
N/A = Not available
PBT = Persistent, Bioaccumulative and Toxic
PNEC = Predicted No Effect Concentration
RRN = REACH Registration Number
vPvB = Very Persistent and Very Bioaccumulative

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
Beta Mercaptoethanol	
Acute Tox. 4, H312	Calculation method
Skin Irrit. 2, H315	Calculation method
Eye Dam. 1, H318	Calculation method
Skin Sens. 1, H317	Calculation method
Repr. 2, H361f	Calculation method
STOT RE 2, H373	Calculation method
Aquatic Chronic 3, H412	Calculation method

Full text of abbreviated H statements

Beta Mercaptoethanol	
H301	Toxic if swallowed.
H310	Fatal in contact with skin.
H312	Harmful in contact with skin.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H331	Toxic if inhaled.
H361f	Suspected of damaging fertility.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H411	Toxic to aquatic life with long lasting effects.
H412	Harmful to aquatic life with long lasting effects.

Full text of classifications [CLP/GHS]

SECTION 16: Other information

Beta Mercaptoethanol	
Acute Tox. 2	ACUTE TOXICITY - Category 2
Acute Tox. 3	ACUTE TOXICITY - Category 3
Acute Tox. 4	ACUTE TOXICITY - Category 4
Aquatic Acute 1	SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 1
Aquatic Chronic 2	LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 2
Aquatic Chronic 3	LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3
Eye Dam. 1	SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1
Repr. 2	REPRODUCTIVE TOXICITY - Category 2
Skin Irrit. 2	SKIN CORROSION/IRRITATION - Category 2
Skin Sens. 1	SKIN SENSITISATION - Category 1
Skin Sens. 1A	SKIN SENSITISATION - Category 1A
STOT RE 2	SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 2

Date of issue/ Date of revision : 25/04/2023

Date of previous issue : No previous validation

Version : 1

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