

SAFETY DATA SHEET



JM109 Competent Cells, Part Number 200235

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

1.1 Product identifier

Product name : JM109 Competent Cells, Part Number 200235
Part No. (Kit) : 200235
Part No. : JM109 competent cells 200235-41
pUC 18 DNA Control 200231-42
Plasmid
Beta Mercaptoethanol 210200-43

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

Identified uses	
Analytical reagent.	
JM109 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)

1.3 Details of the supplier of the safety data sheet

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

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

1.4 Emergency telephone number

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

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : JM109 competent cells Mixture
pUC 18 DNA Control Mixture
Plasmid
Beta Mercaptoethanol Mixture

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

Beta Mercaptoethanol

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

Ingredients of unknown toxicity : JM109 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%

Date of issue/Date of revision : 21/12/2017

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SECTION 2: Hazards identification

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 : JM109 competent cells
pUC 18 DNA Control
Plasmid
Beta Mercaptoethanol

No signal word.
No signal word.

Danger

Hazard statements : JM109 competent cells
pUC 18 DNA Control
Plasmid
Beta Mercaptoethanol

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.

Precautionary statements

Prevention : JM109 competent cells
pUC 18 DNA Control
Plasmid
Beta Mercaptoethanol

Not applicable.
Not applicable.

P280 - Wear protective gloves. Wear protective clothing.
Wear eye or face protection.
P273 - Avoid release to the environment.

Response : JM109 competent cells
pUC 18 DNA Control
Plasmid
Beta Mercaptoethanol

Not applicable.
Not applicable.

P304 + P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305 + P310 - IF IN EYES: Immediately call a POISON CENTER or physician.

Storage : JM109 competent cells
pUC 18 DNA Control
Plasmid
Beta Mercaptoethanol

Not applicable.
Not applicable.

Not applicable.

Disposal : JM109 competent cells
pUC 18 DNA Control
Plasmid
Beta Mercaptoethanol

Not applicable.
Not applicable.

P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazardous ingredients : Beta Mercaptoethanol

- 2-Mercaptoethanol

Supplemental label elements : JM109 competent cells
pUC 18 DNA Control
Plasmid
Beta Mercaptoethanol

Not applicable.
Not applicable.

Not applicable.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : JM109 competent cells
pUC 18 DNA Control
Plasmid
Beta Mercaptoethanol

Not applicable.
Not applicable.

Not applicable.

Special packaging requirements

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SECTION 2: Hazards identification

Tactile warning of danger : JM109 competent cells Not applicable.
 pUC 18 DNA Control Not applicable.
 Plasmid
 Beta Mercaptoethanol Not applicable.

2.3 Other hazards

Other hazards which do not result in classification : JM109 competent cells None known.
 pUC 18 DNA Control None known.
 Plasmid
 Beta Mercaptoethanol None known.

SECTION 3: Composition/information on ingredients

3.1 Substances : JM109 competent cells Mixture
 pUC 18 DNA Control Plasmid Mixture
 Beta Mercaptoethanol Mixture

Product/ingredient name	Identifiers	%	Regulation (EC) No. 1272/2008 [CLP]	Type
JM109 competent cells Glycerol	REACH #: Annex V EC: 200-289-5 CAS: 56-81-5	≥10 - ≤25	Not classified.	[2]
Sucrose	REACH #: Annex IV EC: 200-334-9 CAS: 57-50-1	≤10	Not classified.	[2]
Beta Mercaptoethanol 2-Mercaptoethanol	EC: 200-464-6 CAS: 60-24-2	≤12	Acute Tox. 3, H301 Acute Tox. 2, H310 Acute Tox. 2, H330 Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 STOT SE 3, H335 Aquatic Chronic 2, H411 See Section 16 for the full text of the H statements declared above.	[1]

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

Type

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

SECTION 4: First aid measures

4.1 Description of first aid measures

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SECTION 4: First aid measures

Eye contact	: JM109 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	: JM109 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	: JM109 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.
Ingestion	: JM109 competent cells	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
	pUC 18 DNA Control Plasmid	Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
	Beta Mercaptoethanol	Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been

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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 : JM109 competent cells
pUC 18 DNA Control Plasmid
Beta Mercaptoethanol

No action shall be taken involving any personal risk or without suitable training.
No action shall be taken involving any personal risk or without suitable training.
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 : JM109 competent cells
pUC 18 DNA Control Plasmid
Beta Mercaptoethanol

No known significant effects or critical hazards.
No known significant effects or critical hazards.
Causes serious eye damage.

Inhalation : JM109 competent cells
pUC 18 DNA Control Plasmid
Beta Mercaptoethanol

No known significant effects or critical hazards.
No known significant effects or critical hazards.
Harmful if inhaled.

Skin contact : JM109 competent cells
pUC 18 DNA Control Plasmid
Beta Mercaptoethanol

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 : JM109 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.

Over-exposure signs/symptoms

Eye contact : JM109 competent cells
pUC 18 DNA Control Plasmid
Beta Mercaptoethanol

No specific data.
No specific data.
Adverse symptoms may include the following:
pain
watering
redness

Inhalation : JM109 competent cells
pUC 18 DNA Control Plasmid
Beta Mercaptoethanol

No specific data.
No specific data.
No specific data.

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Skin contact	: JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	No specific data. No specific data. Adverse symptoms may include the following: pain or irritation redness blistering may occur
Ingestion	: JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	No specific data. No specific data. Adverse symptoms may include the following: stomach pains

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician	: JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
Specific treatments	: JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	No specific treatment. No specific treatment. No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	: JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire. Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media	: JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	None known. None known. None known.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture	: JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	In a fire or if heated, a pressure increase will occur and the container may burst. In a fire or if heated, a pressure increase will occur and the container may burst. In a fire or if heated, a pressure increase will occur and the container may burst. 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	: JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides halogenated compounds metal oxide/oxides No specific data. Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides

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SECTION 5: Firefighting measures

5.3 Advice for firefighters

Special precautions for fire-fighters	: JM109 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	: JM109 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	: JM109 competent cells	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Put on appropriate personal protective equipment.
	pUC 18 DNA Control Plasmid	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Put on appropriate personal protective equipment.
	Beta Mercaptoethanol	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
For emergency responders	: JM109 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-

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SECTION 6: Accidental release measures

emergency personnel".

6.2 Environmental precautions

: JM109 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

: JM109 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

: JM109 competent cells	Put on appropriate personal protective equipment (see Section 8).
pUC 18 DNA Control Plasmid	Put on appropriate personal protective equipment (see Section 8).
Beta Mercaptoethanol	Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not ingest. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

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SECTION 7: Handling and storage

Advice on general occupational hygiene	: JM109 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	: JM109 competent cells	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
	pUC 18 DNA Control Plasmid	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
	Beta Mercaptoethanol	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

7.3 Specific end use(s)

Recommendations	: JM109 competent cells	Industrial applications, Professional applications.
	pUC 18 DNA Control Plasmid	Industrial applications, Professional applications.
	Beta Mercaptoethanol	Industrial applications, Professional applications.

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SECTION 7: Handling and storage

Industrial sector specific solutions	Industrial sector specific solutions :	JM109 competent cells	Not applicable.
		pUC 18 DNA Control	Not applicable.
		Plasmid	
		Beta Mercaptoethanol	Not applicable.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
JM109 competent cells	
Glycerol	EH40/2005 WELs (United Kingdom (UK), 12/2011). TWA: 10 mg/m ³ 8 hours. Form: Mist
Sucrose	EH40/2005 WELs (United Kingdom (UK), 12/2011). STEL: 20 mg/m ³ 15 minutes. TWA: 10 mg/m ³ 8 hours.

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

DNELs/DMELs

No DNELs/DMELs available.

PNECs

No PNECs available

8.2 Exposure controls

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

Individual protection measures

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

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

Skin protection

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SECTION 8: Exposure controls/personal protection

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

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state	: JM109 competent cells	Liquid.
	pUC 18 DNA Control	Liquid.
	Plasmid	
	Beta Mercaptoethanol	Liquid.
Colour	: JM109 competent cells	Not available.
	pUC 18 DNA Control	Not available.
	Plasmid	
	Beta Mercaptoethanol	Not available.
Odour	: JM109 competent cells	Not available.
	pUC 18 DNA Control	Not available.
	Plasmid	
	Beta Mercaptoethanol	Not available.
Odour threshold	: JM109 competent cells	Not available.
	pUC 18 DNA Control	Not available.
	Plasmid	
	Beta Mercaptoethanol	Not available.
pH	: JM109 competent cells	6.4
	pUC 18 DNA Control	7.5
	Plasmid	
	Beta Mercaptoethanol	Not available.
Melting point/freezing point	: JM109 competent cells	Not available.
	pUC 18 DNA Control	0°C
	Plasmid	
	Beta Mercaptoethanol	Not available.
Initial boiling point and boiling range	: JM109 competent cells	Not available.
	pUC 18 DNA Control	100°C
	Plasmid	
	Beta Mercaptoethanol	Not available.
Flash point	: JM109 competent cells	Not available.
	pUC 18 DNA Control	Not available.
	Plasmid	
	Beta Mercaptoethanol	Not available.

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SECTION 9: Physical and chemical properties

Evaporation rate	: JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not available. Not available. Not available.
Flammability (solid, gas)	: JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not applicable. Not applicable. Not applicable.
Upper/lower flammability or explosive limits	: JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not available. Not available. Not available.
Vapour pressure	: JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not available. Not available. Not available.
Vapour density	: JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not available. Not available. Not available.
Relative density	: JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not available. Not available. Not available.
Solubility(ies)	: JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Soluble in the following materials: cold water and hot water. Easily soluble in the following materials: cold water and hot water. Easily soluble in the following materials: cold water and hot water.
Partition coefficient: n-octanol/water	: JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not available. Not available. Not available.
Auto-ignition temperature	: JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not available. Not available. Not available.
Decomposition temperature	: JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not available. Not available. Not available.
Viscosity	: JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not available. Not available. Not available.
Explosive properties	: JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not available. Not available. Not available.
Oxidising properties	: JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	Not available. Not available. Not available.

9.2 Other information

No additional information.

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SECTION 10: Stability and reactivity

10.1 Reactivity	: JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	No specific test data related to reactivity available for this product or its ingredients. No specific test data related to reactivity available for this product or its ingredients. No specific test data related to reactivity available for this product or its ingredients.
10.2 Chemical stability	: JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	The product is stable. The product is stable. The product is stable.
10.3 Possibility of hazardous reactions	: JM109 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.
10.4 Conditions to avoid	: JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol	No specific data. No specific data. No specific data.
10.5 Incompatible materials	: JM109 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.
10.6 Hazardous decomposition products	: JM109 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.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Beta Mercaptoethanol 2-Mercaptoethanol	LD50 Dermal	Rabbit	200 mg/kg	-
	LD50 Oral	Rat	244 mg/kg	-

Acute toxicity estimates

Route	ATE value
Beta Mercaptoethanol Oral Dermal Inhalation (vapours)	2440 mg/kg 2000 mg/kg 20 mg/l

Irritation/Corrosion

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

Sensitiser

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Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Product/ingredient name	Category	Route of exposure	Target organs
Beta Mercaptoethanol 2-Mercaptoethanol	Category 3	Not applicable.	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on likely routes of exposure : JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol
Routes of entry anticipated: Oral, Dermal, Inhalation.
Not available.
Routes of entry anticipated: Oral, Dermal, Inhalation.

Potential acute health effects

Inhalation : JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol
No known significant effects or critical hazards.
No known significant effects or critical hazards.
Harmful if inhaled.

Ingestion : JM109 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.

Skin contact : JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol
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.

Eye contact : JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol
No known significant effects or critical hazards.
No known significant effects or critical hazards.
Causes serious eye damage.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation : JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol
No specific data.
No specific data.
No specific data.

Ingestion : JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol
No specific data.
No specific data.
Adverse symptoms may include the following:
stomach pains

Skin contact : JM109 competent cells pUC 18 DNA Control Plasmid Beta Mercaptoethanol
No specific data.
No specific data.
Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur

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Eye contact	: JM109 competent cells	No specific data.
	pUC 18 DNA Control	No specific data.
	Plasmid	
	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	: JM109 competent cells	No known significant effects or critical hazards.
	pUC 18 DNA Control	No known significant effects or critical hazards.
	Plasmid	
	Beta Mercaptoethanol	Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
Carcinogenicity	: JM109 competent cells	No known significant effects or critical hazards.
	pUC 18 DNA Control	No known significant effects or critical hazards.
	Plasmid	
	Beta Mercaptoethanol	No known significant effects or critical hazards.
Mutagenicity	: JM109 competent cells	No known significant effects or critical hazards.
	pUC 18 DNA Control	No known significant effects or critical hazards.
	Plasmid	
	Beta Mercaptoethanol	No known significant effects or critical hazards.
Teratogenicity	: JM109 competent cells	No known significant effects or critical hazards.
	pUC 18 DNA Control	No known significant effects or critical hazards.
	Plasmid	
	Beta Mercaptoethanol	No known significant effects or critical hazards.
Developmental effects	: JM109 competent cells	No known significant effects or critical hazards.
	pUC 18 DNA Control	No known significant effects or critical hazards.
	Plasmid	
	Beta Mercaptoethanol	No known significant effects or critical hazards.
Fertility effects	: JM109 competent cells	No known significant effects or critical hazards.
	pUC 18 DNA Control	No known significant effects or critical hazards.
	Plasmid	
	Beta Mercaptoethanol	No known significant effects or critical hazards.

SECTION 12: Ecological information

12.1 Toxicity

Conclusion/Summary : Not available.

12.2 Persistence and degradability

Not available.

12.3 Bioaccumulative potential

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SECTION 12: Ecological information

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

PBT : Not applicable.

vPvB : Not applicable.

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

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

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

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

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 spilled material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

ADR/RID / IMDG / IATA : Not regulated.

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

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

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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 : JM109 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.

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 (Annexes A, B, C, E)

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

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

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SECTION 15: Regulatory information

Thailand	: Not determined.
Turkey	: Not determined.
United States	: All components are listed or exempted.
Viet Nam	: Not determined.

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

SECTION 16: Other information

✓ Indicates information that has changed from previously issued version.

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

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

Classification	Justification
Beta Mercaptoethanol Acute Tox. 4, H312 Acute Tox. 4, H332 Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Chronic 3, H412	Calculation method Calculation method Calculation method Calculation method Calculation method Calculation method

Full text of abbreviated H statements

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

Beta Mercaptoethanol Acute Tox. 2, H310 Acute Tox. 2, H330 Acute Tox. 3, H301 Acute Tox. 4, H312 Acute Tox. 4, H332 Aquatic Chronic 2, H411 Aquatic Chronic 3, H412 Eye Dam. 1, H318 Skin Irrit. 2, H315 Skin Sens. 1, H317 STOT SE 3, H335	ACUTE TOXICITY (dermal) - Category 2 ACUTE TOXICITY (inhalation) - Category 2 ACUTE TOXICITY (oral) - Category 3 ACUTE TOXICITY (dermal) - Category 4 ACUTE TOXICITY (inhalation) - Category 4 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 2 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1 SKIN CORROSION/IRRITATION - Category 2 SKIN SENSITISATION - Category 1 SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE (Respiratory tract irritation) - Category 3
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SECTION 16: Other information

Date of previous issue : No previous validation.

Version : 1

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