Conforms to Code of Practice for the Preparation of Safety Data Sheets for Hazardous Chemicals

SAFETY DATA SHEET

Agilent Technologies

XL10-Gold Kan-r Ultracompetent Cells, Part Number 200317

Section 1. Identification

Product identifier : XL10-Gold Kan-r Ultracompetent Cells, Part Number 200317

Part no. (chemical kit) : 200317

Part no. :

XL10-Gold Kan (r) ultracompetent cells	200317-41
pUC 18 DNA Control Plasmid	200231-42
XL10-Gold 2-Mercaptoethanol	200314-43

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

Identified uses : Analytical reagent.

XL10-Gold Kan (r) ultracompetent cells	1 ml (10 x 0.1 ml)
pUC 18 DNA Control Plasmid	0.01 ml (0.1 ng / µl)
XL10-Gold 2-Mercaptoethanol	0.05 ml

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

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

Section 2. Hazard(s) identification

Classification of the substance or mixture

XL10-Gold Kan (r) ultracompetent cells

H320 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2B

XL10-Gold 2-Mercaptoethanol

H318 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1
H317 SKIN SENSITISATION - Category 1
H361 REPRODUCTIVE TOXICITY - Category 2
H412 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3

XL10-Gold Kan (r) ultracompetent cells: Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment: 5%

GHS label elements

Hazard pictograms : XL10-Gold 2-Mercaptoethanol

Signal word :

XL10-Gold Kan (r) ultracompetent cells	WARNING
pUC 18 DNA Control Plasmid	No signal word.
XL10-Gold 2-Mercaptoethanol	DANGER

Section 2. Hazard(s) identification

Hazard statements

XL10-Gold Kan (r) ultracompetent cells	H320 - Causes eye irritation.
pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
XL10-Gold 2-Mercaptoethanol	H317 - May cause an allergic skin reaction. H318 - Causes serious eye damage. H361 - Suspected of damaging fertility or the unborn child. H412 - Harmful to aquatic life with long lasting effects.

Precautionary statements

Prevention

XL10-Gold Kan (r) ultracompetent cells	Not applicable.
pUC 18 DNA Control Plasmid	Not applicable.
XL10-Gold 2-Mercaptoethanol	P201 - Obtain special instructions before use. P280 - Wear protective gloves, protective clothing and eye or face protection. P273 - Avoid release to the environment.

Response

XL10-Gold Kan (r) ultracompetent cells	P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P337 + P313 - If eye irritation persists: Get medical advice or attention.
pUC 18 DNA Control Plasmid	Not applicable.
XL10-Gold 2-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

XL10-Gold Kan (r) ultracompetent cells	Not applicable.
pUC 18 DNA Control Plasmid	Not applicable.
XL10-Gold 2-Mercaptoethanol	Not applicable.

Disposal

XL10-Gold Kan (r) ultracompetent cells	Not applicable.
pUC 18 DNA Control Plasmid	Not applicable.
XL10-Gold 2-Mercaptoethanol	P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

Supplemental label elements

Additional warning phrases

XL10-Gold Kan (r) ultracompetent cells	Not applicable.
pUC 18 DNA Control Plasmid	Not applicable.
XL10-Gold 2-Mercaptoethanol	Not applicable.

Other hazards which do not result in classification

XL10-Gold Kan (r) ultracompetent cells	None known.
pUC 18 DNA Control Plasmid	None known.
XL10-Gold 2-Mercaptoethanol	None known.

Section 3. Composition and ingredient information

Substance/mixture : XL10-Gold Kan (r) ultracompetent cells — Mixture
pUC 18 DNA Control Plasmid — Mixture
XL10-Gold 2-Mercaptoethanol — Mixture

CAS number/other identifiers

Ingredient name	% (w/w)	CAS number
XL10-Gold Kan (r) ultracompetent cells		
Glycerol	≥10 - ≤30	56-81-5
Dimethyl sulfoxide	≤10	67-68-5
Sucrose	≤10	57-50-1
XL10-Gold 2-Mercaptoethanol		
2-Mercaptoethanol	≤5	60-24-2

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

The total concentration of ingredients in this product, reported or not in this section, is 100%.

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

Section 4. First aid measures

Description of necessary first aid measures

Eye contact

XL10-Gold Kan (r) ultracompetent cells: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. If irritation persists, get medical attention.

pUC 18 DNA Control Plasmid: Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.

XL10-Gold 2-Mercaptoethanol: Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.

Inhalation

XL10-Gold Kan (r) ultracompetent cells: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

pUC 18 DNA Control Plasmid: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.

XL10-Gold: Get medical attention immediately. Call a poison

Section 4. First aid measures

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

Section 4. First aid measures

clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact :

XL10-Gold Kan (r) ultracompetent cells	Causes eye irritation.
pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
XL10-Gold 2-Mercaptoethanol	Causes serious eye damage.

Inhalation :

XL10-Gold Kan (r) ultracompetent cells	No known significant effects or critical hazards.
pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
XL10-Gold 2-Mercaptoethanol	No known significant effects or critical hazards.

Skin contact :

XL10-Gold Kan (r) ultracompetent cells	No known significant effects or critical hazards.
pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
XL10-Gold 2-Mercaptoethanol	May cause an allergic skin reaction.

Ingestion :

XL10-Gold Kan (r) ultracompetent cells	No known significant effects or critical hazards.
pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
XL10-Gold 2-Mercaptoethanol	No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact :

XL10-Gold Kan (r) ultracompetent cells	Adverse symptoms may include the following: irritation watering redness
pUC 18 DNA Control Plasmid	No specific data.
XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following: pain watering redness

Inhalation :

XL10-Gold Kan (r) ultracompetent cells	No specific data.
pUC 18 DNA Control Plasmid	No specific data.
XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations

Skin contact :

XL10-Gold Kan (r) ultracompetent cells	No specific data.
pUC 18 DNA Control Plasmid	No specific data.
XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following: pain or irritation redness blistering may occur reduced foetal weight increase in foetal deaths skeletal malformations

Section 4. First aid measures

Ingestion :

XL10-Gold Kan (r) ultracompetent cells	No specific data.
pUC 18 DNA Control Plasmid	No specific data.
XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following: stomach pains reduced foetal weight increase in foetal deaths skeletal malformations

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

Notes to physician :

XL10-Gold Kan (r) ultracompetent 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.
XL10-Gold 2-Mercaptoethanol	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments :

XL10-Gold Kan (r) ultracompetent cells	No specific treatment.
pUC 18 DNA Control Plasmid	No specific treatment.
XL10-Gold 2-Mercaptoethanol	No specific treatment.

Protection of first-aiders :

XL10-Gold Kan (r) ultracompetent cells	No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
pUC 18 DNA Control Plasmid	No action shall be taken involving any personal risk or without suitable training.
XL10-Gold 2-Mercaptoethanol	No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Firefighting measures

Extinguishing media

Suitable extinguishing media :

XL10-Gold Kan (r) ultracompetent cells	Use an extinguishing agent suitable for the surrounding fire.
pUC 18 DNA Control Plasmid	Use an extinguishing agent suitable for the surrounding fire.
XL10-Gold 2-Mercaptoethanol	Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media :

XL10-Gold Kan (r) ultracompetent cells	None known.
pUC 18 DNA Control Plasmid	None known.
XL10-Gold 2-Mercaptoethanol	None known.

Section 5. Firefighting measures

Specific hazards arising from the chemical

XL10-Gold Kan (r) ultracompetent 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.
XL10-Gold 2-Mercaptoethanol	In a fire or if heated, a pressure increase will occur and the container may burst. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products

XL10-Gold Kan (r) ultracompetent 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.
XL10-Gold 2-Mercaptoethanol	Decomposition products may include the following materials: carbon dioxide carbon monoxide sulfur oxides halogenated compounds metal oxide/oxides

Special protective actions for fire-fighters

XL10-Gold Kan (r) ultracompetent 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.
XL10-Gold 2-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

XL10-Gold Kan (r) ultracompetent cells	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
pUC 18 DNA Control Plasmid	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
XL10-Gold 2-Mercaptoethanol	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

XL10-Gold Kan (r) ultracompetent 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. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

Section 6. Accidental release measures

	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.
	XL10-Gold 2-Mercaptoethanol	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through 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 :	XL10-Gold Kan (r) ultracompetent 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".
	XL10-Gold 2-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".
Environmental precautions :	XL10-Gold Kan (r) ultracompetent 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).
	XL10-Gold 2-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.

Methods and material for containment and cleaning up

Methods for cleaning up :	XL10-Gold Kan (r) ultracompetent 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.
	XL10-Gold 2-Mercaptoethanol	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste

Section 6. Accidental release measures

disposal contractor.

Section 7. Handling and storage

Precautions for safe handling

Protective measures	:	XL10-Gold Kan (r) ultracompetent cells	Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour or mist. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
		pUC 18 DNA Control Plasmid	Put on appropriate personal protective equipment (see Section 8).
		XL10-Gold 2-Mercaptoethanol	Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe 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	:	XL10-Gold Kan (r) ultracompetent 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.
		XL10-Gold 2-Mercaptoethanol	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
Conditions for safe storage, including any incompatibilities	:	XL10-Gold Kan (r) ultracompetent 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

Section 7. Handling and storage

	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.
XL10-Gold 2-Mercaptoethanol	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls and personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
XL10-Gold Kan (r) ultracompetent cells	
Glycerol	**Safe Work Australia (Australia, 10/2022).** TWA: 10 mg/m³ 8 hours.
Dimethyl sulfoxide	**DFG MAC-values list (Germany, 7/2022).** **Absorbed through skin.** PEAK: 320 mg/m³, 4 times per shift, 15 minutes. TWA: 160 mg/m³ 8 hours. PEAK: 100 ppm, 4 times per shift, 15 minutes. TWA: 50 ppm 8 hours.
Sucrose	**Safe Work Australia (Australia, 10/2022).** TWA: 10 mg/m³ 8 hours.

Biological exposure indices

No exposure indices known.

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.

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

Individual protection measures

Section 8. Exposure controls and personal protection

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.

Section 9. Physical and chemical properties and safety characteristics

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

Appearance

Physical state :

XL10-Gold Kan (r) ultracompetent cells	Liquid.
pUC 18 DNA Control Plasmid	Liquid.
XL10-Gold 2-Mercaptoethanol	Liquid.

Colour :

XL10-Gold Kan (r) ultracompetent cells	Not available.
pUC 18 DNA Control Plasmid	Not available.
XL10-Gold 2-Mercaptoethanol	Not available.

Odour :

XL10-Gold Kan (r) ultracompetent cells	Not available.
pUC 18 DNA Control Plasmid	Not available.
XL10-Gold 2-Mercaptoethanol	Not available.

Odour threshold :

XL10-Gold Kan (r) ultracompetent cells	Not available.
pUC 18 DNA Control Plasmid	Not available.
XL10-Gold 2-Mercaptoethanol	Not available.

Section 9. Physical and chemical properties and safety characteristics

pH :

XL10-Gold Kan (r) ultracompetent cells	6.4
pUC 18 DNA Control Plasmid	7.5
XL10-Gold 2-Mercaptoethanol	Not available.

Melting point/freezing point :

XL10-Gold Kan (r) ultracompetent cells	Not available.
pUC 18 DNA Control Plasmid	0°C (32°F)
XL10-Gold 2-Mercaptoethanol	Not available.

Boiling point, initial boiling point, and boiling range :

XL10-Gold Kan (r) ultracompetent cells	Not available.
pUC 18 DNA Control Plasmid	100°C (212°F)
XL10-Gold 2-Mercaptoethanol	Not available.

Flash point :

Ingredient name	Closed cup °C	Closed cup °F	Closed cup Method	Open cup °C	Open cup °F	Open cup Method
XL10-Gold Kan (r) ultracompetent cells						
Dimethyl sulfoxide	87	188.6	ASTM D 93	87	188.6	-
Glycerol	-	-	-	177	350.6	-
XL10-Gold 2-Mercaptoethanol						
2-Mercaptoethanol	74	165.2	-	74	165.2	-

Evaporation rate :

XL10-Gold Kan (r) ultracompetent cells	Not available.
pUC 18 DNA Control Plasmid	Not available.
XL10-Gold 2-Mercaptoethanol	Not available.

Flammability :

XL10-Gold Kan (r) ultracompetent cells	Not applicable.
pUC 18 DNA Control Plasmid	Not applicable.
XL10-Gold 2-Mercaptoethanol	Not applicable.

Lower and upper explosion limit/flammability limit :

XL10-Gold Kan (r) ultracompetent cells	Not available.
pUC 18 DNA Control Plasmid	Not available.
XL10-Gold 2-Mercaptoethanol	Not available.

Vapour pressure :

Ingredient name	Vapour Pressure at 20˚C mm Hg	Vapour Pressure at 20˚C kPa	Vapour Pressure at 20˚C Method	Vapour pressure at 50˚C mm Hg	Vapour pressure at 50˚C kPa	Vapour pressure at 50˚C Method
XL10-Gold Kan (r) ultracompetent cells						
water	17.5	2.3	-	92.258	12.3	-
Dimethyl sulfoxide	0.42	0.056	EU A.4	-	-	-
pUC 18 DNA						

Section 9. Physical and chemical properties and safety characteristics

Control Plasmid						
water	17.5	2.3	-	92.258	12.3	-
XL10-Gold 2-Mercaptoethanol						
water	17.5	2.3	-	92.258	12.3	-
2-Mercaptoethanol	0.98	0.13	-	-	-	-

Relative vapour density :

XL10-Gold Kan (r) ultracompetent cells	Not available.
pUC 18 DNA Control Plasmid	Not available.
XL10-Gold 2-Mercaptoethanol	Not available.

Relative density :

XL10-Gold Kan (r) ultracompetent cells	Not available.
pUC 18 DNA Control Plasmid	Not available.
XL10-Gold 2-Mercaptoethanol	Not available.

Solubility(ies) :

Media	Result
XL10-Gold Kan (r) ultracompetent cells	
water	Soluble
pUC 18 DNA Control Plasmid	
water	Soluble
XL10-Gold 2-Mercaptoethanol	
water	Soluble

Partition coefficient: n-octanol/water :

XL10-Gold Kan (r) ultracompetent cells	Not applicable.
pUC 18 DNA Control Plasmid	Not applicable.
XL10-Gold 2-Mercaptoethanol	Not applicable.

Auto-ignition temperature :

Ingredient name	°C	°F	Method
XL10-Gold Kan (r) ultracompetent cells			
Dimethyl sulfoxide	300 to 302	572 to 575.6	-
Glycerol	370	698	-
XL10-Gold 2-Mercaptoethanol			
2-Mercaptoethanol	295	563	-

Decomposition temperature :

XL10-Gold Kan (r) ultracompetent cells	Not available.
pUC 18 DNA Control Plasmid	Not available.
XL10-Gold 2-Mercaptoethanol	Not available.

Viscosity :

XL10-Gold Kan (r) ultracompetent cells	Not available.
pUC 18 DNA Control Plasmid	Not available.
XL10-Gold 2-Mercaptoethanol	Not available.

Particle characteristics

Section 9. Physical and chemical properties and safety characteristics

Median particle size :

XL10-Gold Kan (r) ultracompetent cells	Not applicable.
pUC 18 DNA Control Plasmid	Not applicable.
XL10-Gold 2-Mercaptoethanol	Not applicable.

Section 10. Stability and reactivity

Reactivity :

XL10-Gold Kan (r) ultracompetent 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.
XL10-Gold 2-Mercaptoethanol	No specific test data related to reactivity available for this product or its ingredients.

Chemical stability :

XL10-Gold Kan (r) ultracompetent cells	The product is stable.
pUC 18 DNA Control Plasmid	The product is stable.
XL10-Gold 2-Mercaptoethanol	The product is stable.

Possibility of hazardous reactions :

XL10-Gold Kan (r) ultracompetent 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.
XL10-Gold 2-Mercaptoethanol	Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid :

XL10-Gold Kan (r) ultracompetent cells	No specific data.
pUC 18 DNA Control Plasmid	No specific data.
XL10-Gold 2-Mercaptoethanol	No specific data.

Incompatible materials :

XL10-Gold Kan (r) ultracompetent cells	May react or be incompatible with oxidising materials.
pUC 18 DNA Control Plasmid	May react or be incompatible with oxidising materials.
XL10-Gold 2-Mercaptoethanol	May react or be incompatible with oxidising materials.

Hazardous decomposition products :

XL10-Gold Kan (r) ultracompetent 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.
XL10-Gold 2-Mercaptoethanol	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Section 11. Toxicological information

Product/ingredient name	Result	Species	Dose	Exposure
XL10-Gold Kan (r) ultracompetent cells				
Glycerol	LD50 Oral	Rat	12600 mg/kg	-
Dimethyl sulfoxide	LD50 Dermal	Rat	40000 mg/kg	-
	LD50 Oral	Rat	14500 mg/kg	-
Sucrose	LD50 Oral	Rat	29700 mg/kg	-
XL10-Gold 2-Mercaptoethanol				
2-Mercaptoethanol	LD50 Oral	Rat	244 mg/kg	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
XL10-Gold Kan (r) ultracompetent cells					
Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
Dimethyl sulfoxide	Eyes - Mild irritant	Rabbit	-	100 mg	-
	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Skin - Mild irritant	Rabbit	-	100 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
XL10-Gold 2-Mercaptoethanol					
2-Mercaptoethanol	Eyes - Severe irritant	Rabbit	-	2 mg	-

Sensitisation

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)

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

Specific target organ toxicity (repeated exposure)

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

Aspiration hazard

Not available.

Section 11. Toxicological information

Information on likely routes of exposure

XL10-Gold Kan (r) ultracompetent cells	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
pUC 18 DNA Control Plasmid	Not available.
XL10-Gold 2-Mercaptoethanol	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.

Potential acute health effects

Eye contact

XL10-Gold Kan (r) ultracompetent cells	Causes eye irritation.
pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
XL10-Gold 2-Mercaptoethanol	Causes serious eye damage.

Inhalation

XL10-Gold Kan (r) ultracompetent cells	No known significant effects or critical hazards.
pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
XL10-Gold 2-Mercaptoethanol	No known significant effects or critical hazards.

Skin contact

XL10-Gold Kan (r) ultracompetent cells	No known significant effects or critical hazards.
pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
XL10-Gold 2-Mercaptoethanol	May cause an allergic skin reaction.

Ingestion

XL10-Gold Kan (r) ultracompetent cells	No known significant effects or critical hazards.
pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
XL10-Gold 2-Mercaptoethanol	No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact

XL10-Gold Kan (r) ultracompetent cells	Adverse symptoms may include the following: irritation watering redness
pUC 18 DNA Control Plasmid	No specific data.
XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following: pain watering redness

Inhalation

XL10-Gold Kan (r) ultracompetent cells	No specific data.
pUC 18 DNA Control Plasmid	No specific data.
XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following: reduced foetal weight increase in foetal deaths skeletal malformations

Skin contact

XL10-Gold Kan (r) ultracompetent cells	No specific data.
pUC 18 DNA Control Plasmid	No specific data.
XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following: pain or irritation redness blistering may occur reduced foetal weight increase in foetal deaths skeletal malformations

Section 11. Toxicological information

Ingestion :

XL10-Gold Kan (r) ultracompetent cells	No specific data.
pUC 18 DNA Control Plasmid	No specific data.
XL10-Gold 2-Mercaptoethanol	Adverse symptoms may include the following: stomach pains reduced foetal weight increase in foetal deaths skeletal malformations

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 :

XL10-Gold Kan (r) ultracompetent cells	No known significant effects or critical hazards.
pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
XL10-Gold 2-Mercaptoethanol	Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity :

XL10-Gold Kan (r) ultracompetent cells	No known significant effects or critical hazards.
pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
XL10-Gold 2-Mercaptoethanol	No known significant effects or critical hazards.

Mutagenicity :

XL10-Gold Kan (r) ultracompetent cells	No known significant effects or critical hazards.
pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
XL10-Gold 2-Mercaptoethanol	No known significant effects or critical hazards.

Reproductive toxicity :

XL10-Gold Kan (r) ultracompetent cells	No known significant effects or critical hazards.
pUC 18 DNA Control Plasmid	No known significant effects or critical hazards.
XL10-Gold 2-Mercaptoethanol	Suspected of damaging fertility or the unborn child.

Numerical measures of toxicity

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapours) (mg/l)	Inhalation (dusts and mists) (mg/l)
XL10-Gold Kan (r) ultracompetent cells					
Glycerol	12600	N/A	N/A	N/A	N/A
Dimethyl sulfoxide	14500	40000	N/A	N/A	N/A
Sucrose	29700	N/A	N/A	N/A	N/A
XL10-Gold 2-Mercaptoethanol					
XL10-Gold 2-Mercaptoethanol	5545.5	4545.5	N/A	60.7	N/A
2-Mercaptoethanol	244	200	N/A	3	N/A

Section 11. Toxicological information

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
XL10-Gold Kan (r) ultracompetent cells			
Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - *Oncorhynchus mykiss*	96 hours
Dimethyl sulfoxide	Acute LC50 25000 ppm Fresh water	Daphnia - *Daphnia magna* - Neonate	48 hours
	Acute LC50 34000000 µg/l Fresh water	Fish - *Pimephales promelas*	96 hours
	Chronic NOEC 100 ul/L Marine water	Algae - *Ulva lactuca*	72 hours
	Chronic NOEC 100 ul/L Fresh water	Daphnia - *Daphnia magna* - Juvenile (Fledgling, Hatchling, Weanling)	21 days

Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
XL10-Gold Kan (r) ultracompetent cells				
Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-
Dimethyl sulfoxide	OECD 301D Ready Biodegradability - Closed Bottle Test	31 % - Not readily - 28 days	-	-
XL10-Gold 2-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
XL10-Gold Kan (r) ultracompetent cells			
Dimethyl sulfoxide	-	-	Not readily
XL10-Gold 2-Mercaptoethanol			
2-Mercaptoethanol	-	-	Not readily

Bioaccumulative potential

Section 12. Ecological information

Product/ingredient name	$LogP_{ow}$	BCF	Potential
XL10-Gold Kan (r) ultracompetent cells			
Glycerol	-1.76	-	Low
Dimethyl sulfoxide	-1.35	3.16	Low
Sucrose	-3.7	-	Low
XL10-Gold 2-Mercaptoethanol			
2-Mercaptoethanol	-0.056	-	Low

Mobility in soil

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

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

Section 13. Disposal considerations

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

Section 14. Transport information

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

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

Transport in bulk according to IMO instruments : Not available.

Section 15. Regulatory information

Standard for the Uniform Scheduling of Medicines and Poisons

6

Model Work Health and Safety Regulations - Scheduled Substances

No listed substance

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Section 15. Regulatory information

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.

New Zealand : Not determined.

United States : All components are active or exempted.

Section 16. Any other relevant information

History

Date of issue/Date of revision : 30/06/2023

Date of previous issue : 03/12/2020

Version : 8

Key to abbreviations : ADG = Australian Dangerous Goods
ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
N/A = Not available
SUSMP = Standard Uniform Schedule of Medicine and Poisons
UN = United Nations

Procedure used to derive the classification

Classification	Justification
XL10-Gold Kan (r) ultracompetent cells	
SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2B	Calculation method
XL10-Gold 2-Mercaptoethanol	
SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1	Calculation method
SKIN SENSITISATION - Category 1	Calculation method
REPRODUCTIVE TOXICITY - Category 2	Calculation method
LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 3	Calculation method

Indicates information that has changed from previously issued version.

Notice to reader

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