



03 November 2017

Kit Components

Product Code	Description
ERT12925K	EpiScript™ RNase H- Reverse Transcriptase

Components

EpiScript™ Reverse Transcriptase	E0144-200D2
DTT	SS000065-D8
10X RT Reaction Buffer	SS000737-D3

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

1.1. Product identifier

Product name : EpiScript™ Reverse Transcriptase

Product form : Mixture

Product code : E0144-200D1, E0144-200D2

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

Use of the substance/mixture : Laboratory chemical.

1.3. Details of the supplier of the safety data sheet

Lucigen Corporation
2905 Parmenter Street
Middleton, WI 53562
U.S.A.
Phone: (608) 831-9011
Fax: (608) 831-9012
E-mail: techserv@lucigen.com

1.4. Emergency telephone number

Emergency number : 1-888-575-9695 (Lucigen: Monday-Friday, 8:00AM-5:00PM)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Not classified.

2.2. Label elements

GHS-US labelling

No labeling applicable.

2.3. Other hazards

Irritant to eyes and skin. Target organs are kidneys.

2.4. Unknown acute toxicity (GHS-US)

No data available.

SECTION 3: Composition/information on ingredients

3.2. Mixture

Name	Product identifier	%
Glycerol, CAS # 56-85-1 EC# 200-289-5 Chemical Formula: C ₃ H ₈ O ₃ Molecular Weight: 92.09 g/mol	Ingredient in product.	50

Synonyms: Glycerin, 1,2,3-Propanetriol

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : If exposed or concerned, consult a physician. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before re-use. Never give anything to an unconscious person.

First-aid measures after inhalation : IF INHALED: Remove to fresh air and keep at rest in a comfortable position for breathing. If not breathing, give artificial respiration. Consult a physician.

First-aid measures after skin contact : IF ON SKIN (or clothing): Remove affected clothing and wash all exposed skin for at least 15 minutes with tepid water. Consult a physician.

First-aid measures after eye contact : IF IN EYES: Immediately flush with plenty of tepid water for at least 15 minutes. Remove contact lenses if present and easy to do so. Continue rinsing. Consult a physician.

First-aid measures after ingestion : IF SWALLOWED: Rinse mouth thoroughly and consult a physician. Do not induce vomiting.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries : Not expected to present a significant acute hazard under anticipated conditions of normal use.

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Symptoms/injuries after inhalation	: May cause upper respiratory irritation.
Symptoms/injuries after skin contact	: May cause skin irritation.
Symptoms/injuries after eye contact	: Direct contact with the eyes is likely to be irritating.
Symptoms/injuries after ingestion	: May cause gastrointestinal irritation.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray, carbon dioxide, dry chemical powder, or appropriate foam.

5.2. Special hazards arising from the substance or mixture

Fire hazard	: Emits toxic fumes under fire conditions.
Explosion hazard	: Emits toxic fumes under fire conditions.
Reactivity	: No dangerous reactions known under normal conditions of use.

5.3. Advice for firefighters

Firefighting instructions	: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Protection during firefighting	: Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Ventilate area. Evacuate area. Keep upwind. Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8).

6.1.1. For non-emergency personnel

Protective equipment : Wear Personal Protective Equipment as described in Section 8.

6.1.2. For emergency responders

Protective equipment : Wear suitable protective clothing, gloves, respirator, and eye or face protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment	: Contain any spills with dikes or inert absorbents (e.g., sand or vermiculite) to prevent migration and entry into sewers or streams.
Methods for cleaning up	: Soak up spills with inert absorbants, such as sand or vermiculite as soon as possible. Place in closed waste container for disposal. This material and its container must be disposed of in a safe way, and as per local, state, and federal legislation.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Wear recommended personal protective equipment. Wash hands and other exposed areas with mild soap and water after handling material, leaving the laboratory, before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a well-ventilated place. Keep container tightly closed. Do not store with sodium hydride, phosphorous trioxide, perchloric acid, chlorine, calcium hypochlorite, nitric acid, sulphuric acid, sodium peroxide, hydrogen peroxide, or potassium permanganate, as these substances may cause a violent or explosive reaction if they come in to direct contact. Mixture is hygroscopic.

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SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Components with workplace control parameters

Component	CAS-No.	Value	Control parameters	Basis
Glycerol	56-81-5	TWA	10 mg/m3	USA. OSHA – TABLE Z-1 Limits for Air Contaminants – 1910.1000
		TWA	10 mg/3	USA. ACGIH Threshold Limit Values (TLV)
	Remarks	Upper Respiratory Tract Irritation		
		TWA	5 mg/m3	USA. Occupational Exposure Limits (OSHA) – Table Z-1 Limits for Air Contaminants
		TWA	15 mg/m3	USA. Occupational Exposure Limits (OSHA) – Table Z-1 Limits for Air Contaminants

8.2. Exposure controls

Appropriate engineering controls

: Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Ensure adequate ventilation, especially in confined areas. Emergency safety shower and eye wash station should be available. Avoid prolonged or repeated exposure.

Personal protective equipment

: Gloves. Protective goggles. Laboratory Coat.



Hand protection

: Use gloves chemically resistant to this material when prolonged or repeated contact could occur. Gloves should be classified under Standard EN 374 or ASTM F1296. Suitable gloves for this specific application can be recommended by the glove supplier. Suggested glove materials are: Neoprene, Nitrile.

Eye protection

: Safety goggles should be worn when working with mixture. Avoid direct contact with eyes.

Skin and body protection

: Wear long sleeves, and chemically impervious PPE/coveralls to minimize bodily exposure.

Respiratory protection

: Use NIOSH/MSHA-approved dust/particulate respirator. Where vapor, mist, or dust exceed PELs or other applicable OELs, use NIOSH-approved respiratory protective equipment. Do not breathe in vapour, mist, or dust.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Liquid, viscous and colorless
Color	: Colorless
Odor	: Odorless
Odor Threshold	: No data available
pH	: No data available
Melting point	: 20°C
Freezing point (50% aqueous solution)	: -23°C
Boiling point	: 182°C at 20 mm
Flash point	: 176°C
Relative evaporation rate	: No data available
Flammability (solid, gas)	: No data available
Vapour pressure	: 3 mm at 20°C
Relative vapour density at 20 °C	: 3.1
Relative density	: No data available
Solubility in Water	: Miscible (>10%)
Log Pow	: No data available
Log Kow	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available

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Oxidising properties : No data available

Explosive limits : No data available

9.2. Other information

None.

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reactions known under normal conditions of use.

10.2. Chemical stability

Stable under use and storage conditions as recommended in section 7.

10.3. Possibility of hazardous reactions

None known. Hazardous polymerization does not occur.

10.4. Conditions to avoid

None known.

10.5. Incompatible materials

Strong oxidizing agents, strong bases.

10.6. Hazardous decomposition products

Carbon monoxide, carbon dioxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : No data available

Skin corrosion/irritation : No data available

Serious eye damage/irritation : No data available

Respiratory or skin sensitisation : No data available

Germ cell mutagenicity : No data available

Carcinogenicity : IARC – No component of this product present at levels greater than or equal to 0.1% is identified as probablye, possible, or confirmed human carcinogen by IARC.

ACGIH – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

NTP – No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticpated carcinogen by NTP.

OSHA – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinoen or potential carcinogen by OSHA.

Reproductive toxicity : No data available

Specific target organ toxicity (single exposure) : No data available

Specific target organ toxicity (repeated exposure) : No data available

Aspiration hazard : No data available

Symptoms/injuries after inhalation : May cause upper respiratory irratation. May cause headaches.

Symptoms/injuries after skin contact : May cause skin irritation.

Symptoms/injuries after eye contact : Direct contact with the eyes is likely to be irritating.

Symptoms/injuries after ingestion : May cause gastrointestinal irritation.

Additional Information : RTECS: MA8050000. Prolonged exposure may cause uausea, vomitting, and headache. Kidneys may be affected.

SECTION 12: Ecological information

12.1. Toxicity

No additional information available

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

No additional information available

12.4. Mobility in soil

No additional information available

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12.5. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Obtain the consent of pollution control authorities before discharging to wastewater treatment plants. Product should not be discharged to surface waters without a NPDES permit.

Waste disposal recommendations : Dispose in a safe manner in accordance with local, state, and federal regulations. Avoid release to the environment.

SECTION 14: Transport information

In accordance with DOT

Not hazardous for transport

Additional information

Other information : No supplementary information available.

Transport by sea

No additional information available

Air transport

No additional information available

SECTION 15: Regulatory information

15.1. US Federal regulations

SARA 304 Extremely Hazardous Substances Reportable Quantity

This product does not contain any components with a section 304 EHS RQ.

SARA 311/312 Hazards

Chronic Health Hazard

SARA 302

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313

This materials does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

15.2. International regulations

European Union Directive 67/548/EEC: Irritant R36/38, irritant to eyes and skin. S26, in the case of eye contact, rinse immediately with plenty of water and consult a physician. S36, wear appropriate personal protective equipment.

15.3. US State regulations

California Proposition 65

This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm.

Massachusetts Right To Know Components

Glycercol, CAS 56-81-5

New Jersey Right to Know Hazardous Substance List

Glycerol, CAS 56-81-5

Pennsylvania Right to Know List

Glycercol, CAS 56-81-5

SECTION 16: Other information

Indication of changes : Revision A: Updated format.

Revision date : 07/25/2017

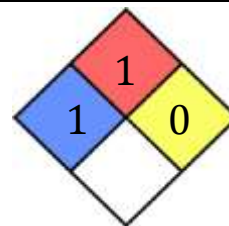
Other information : Author: Lucigen Corporation

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NFPA health hazard	: 1 – Exposure will cause irritation with only minor residual injury.
NFPA fire hazard	: 1 – Flash point is at or above 93.3°C.
NFPA reactivity	: 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health	: 1
Flammability	: 1
Physical Hazard	: 0
Personal Protection	:

This information is disclosed to the best of Lucigen's knowledge. This document does not constitute a contractual relationship with product end users or handlers with respect to the possible presence of hazards in this item. Disposal should be in accordance with applicable regional, national and local laws and regulations.

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

1.1. Product identifier

Product name : DTT (DL-Dithiothreitol), 100 mM
 Product form : Mixture
 Product code : SS000065-D2, SS000065-D3, SS000065-D5, SS000065-D6, SS000065-D7, SS000065-D8
 CAS Number : 3483-12-3

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

Use of the substance/mixture : Reducing agent used in molecular biology reactions, laboratory chemical.

1.3. Details of the supplier of the safety data sheet

Lucigen Corporation
 2905 Parmenter Street
 Middleton, WI 53562
 U.S.A.
 Phone: (608) 831-9011
 Fax: (608) 831-9012
 E-mail: techserv@lucigen.com

1.4. Emergency telephone number

Emergency number : 1-888-575-9695 (Lucigen: Monday-Friday, 8:00AM-5:00PM)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Acute toxicity, Oral (Category 4), H302
 Skin irritation (Category 2), H315
 Eye irritation (Category 2A), H319

2.2. Label elements

GHS-US labelling elements, including precautionary statements

Pictogram :



Signal Word :

Warning

Hazard statement(s) :

H302 : Harmful if swallowed.
 H315 : Causes skin irritation.
 H319 : Causes serious eye irritation.

Precautionary statement(s)

P264 : Wash skin thoroughly after handling.
 P270 : Do not eat, drink, or smoke when using this product.
 P280 : Wear protective gloves/eye protection/face protection.
 P301+P312+P330 : IF SWALLOWED: Call a POISON CONTROL CENTER or physician. Rinse mouth.
 P302+P352 : IF ON SKIN: Wash with soap and tepid water.
 P305+P351+P338 : IF IN EYES: Rinse with tepid water for 15 minutes. Remove contacts if present and it is easy to do so. Continue rinsing.
 P332+P313 : If skin irritation occurs: Wash with soap and tepid water. Contact a physician if irritation occurs.
 P337+P313 : If eye irritation occurs: Rinse with tepid water for 15 minutes. Contact a physician if irritation occurs.
 P362 : Remove contaminated clothing and wash before reusing.
 P501 : Dispose of contents/container to an approved/licensed waste disposal plant/facility.

2.3. Other hazards not otherwise classified or not covered by GHS

None.

2.4. Unknown acute toxicity (GHS-US)

No data available.

DTT (DL-Dithiothreitol), 100 mM.

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SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%
DTT, CAS # 3483-12-3 EC # 222-468-7 Chemical Formula: C ₄ H ₁₀ O ₂ S ₂ Molecular Weight: 154.25 g/mol	Ingredient in product.	0.3-1.5

Synonyms: DL-Dithiothreitol, *threo*-1,4-Dimercapto-2,3-butanediol, Cleland's reagent, (R*,R*)-1,4-Dimercaptobutane-2,3-diol

SECTION 4: First aid measures

4.1. Description of first aid measures

- First-aid measures general : If exposed or concerned, consult a physician. Show this safety data sheet to the doctor in attendance. Discard contaminated clothing. Never give anything to an unconscious person.
- First-aid measures after inhalation : IF INHALED: Remove to fresh air and keep at rest in a comfortable position for breathing. If not breathing, give artificial respiration. Consult a physician.
- First-aid measures after skin contact : IF ON SKIN (or clothing): Remove affected clothing and wash all exposed skin for at least 15 minutes with tepid water. Consult a physician.
- First-aid measures after eye contact : IF IN EYES: Immediately flush with plenty of tepid water for at least 15 minutes. Remove contact lenses if present and easy to do so. Continue rinsing. Consult a physician.
- First-aid measures after ingestion : IF SWALLOWED: Rinse mouth thoroughly and consult a physician. Do not induce vomiting.

4.2. Most important symptoms and effects, both acute and delayed

- Symptoms/injuries : Not expected to present a significant acute hazard under anticipated conditions of normal use.
- Symptoms/injuries after inhalation : May cause upper respiratory irritation.
- Symptoms/injuries after skin contact : May cause skin irritation.
- Symptoms/injuries after eye contact : Direct contact with the eyes is likely to be irritating.
- Symptoms/injuries after ingestion : May cause gastrointestinal irritation.

4.3. Indication of any immediate medical attention and special treatment needed

Exposure may cause nausea, headache, vomiting, and central nervous system depression. Consult a physician if experiencing symptoms after exposure.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : In case of fire, use carbon dioxide, dry chemical, or other appropriate foam. Use agents most appropriate to extinguish the fire.

5.2. Special hazards arising from the substance or mixture

- Fire hazard : Emits toxic fumes under fire conditions.
- Explosion hazard : Product is not explosive.
- Reactivity : No dangerous reactions known under normal conditions of use.

5.3. Advice for firefighters

- Firefighting instructions : Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
- Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Ventilate area. Evacuate area. Keep upwind. Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8).

6.1.1. For non-emergency personnel

Protective equipment : Wear Personal Protective Equipment as described in Section 8.

6.1.2. For emergency responders

Protective equipment : Wear suitable protective clothing, rubber gloves, rubber boots, respirator, and eye or face protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to drains, sewers and public waters. Notify authorities if liquid enters sewers or public waters. Avoid release to the environment.

DTT (DL-Dithiothreitol), 100 mM.

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6.3. Methods and material for containment and cleaning up

- For containment : Contain any spills with dikes or inert absorbents (e.g., sand or vermiculite) to prevent migration and entry into sewers or streams.
- Methods for cleaning up : Soak up spills with inert absorbents, such as sand or vermiculite as soon as possible. Place in closed waste container for disposal. This material and its container must be disposed of in a safe way, and as per local, state, and federal legislation.

6.4. Reference to other sections

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Wear recommended personal protective equipment and ensure working in an area with good ventilation. Wash hands and other exposed areas with mild soap and water after handling material, leaving the laboratory, before eating, drinking or smoking and when leaving work. Do not breathe in vapour, mist, or dust. Avoid prolonged or repeated exposure.

7.2. Conditions for safe storage, including any incompatibilities

- Storage conditions : Keep container tightly closed.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

- Components with workplace control parameters
- Contains no substances with occupational exposure limits.

8.2. Exposure controls

- Appropriate engineering controls : Exercise caution when handling. Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Ensure adequate ventilation, especially in confined areas. Emergency safety shower and eye wash station should be available. Avoid prolonged or repeated exposure.
- Personal protective equipment : Gloves. Protective goggles. Laboratory Coat.



- Hand protection : Use gloves chemically resistant to this material when prolonged or repeated contact could occur. Gloves should be classified under Standard EN 374 or ASTM F1296. Suitable gloves for this specific application can be recommended by the glove supplier. Gloves should be compatible with solvent if dissolved.
- Eye protection : Safety goggles should be worn when working with mixture. Avoid direct contact with eyes.
- Skin and body protection : Wear long sleeves, and chemically impervious PPE/coveralls to minimize bodily exposure.
- Respiratory protection : Use NIOSH/MSHA-approved dust/particulate respirator. Where vapor, mist, or dust exceed PELs or other applicable OELs, use NIOSH-approved respiratory protective equipment. Do not breathe in vapour, mist, or dust.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties of glycerol

- Physical state : Liquid, contains dissolved powder
- Color : Clear solution at room temperature
- Odor : No data available
- Odor Threshold : No data available
- pH : No data available
- Melting point : Powder melts at 42-44°C
- Freezing point : No data available
- Boiling point : No data available
- Flash point : > 110°C
- Relative evaporation rate : No data available
- Flammability (solid, gas) : No data available
- Vapour pressure : No data available
- Relative vapour density at 20 °C : No data available

DTT (DL-Dithiothreitol), 100 mM.

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Relative density	: No data available
Solubility in Water	: No data available
Log Pow	: No data available
Log Kow	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidising properties	: No data available
Explosive limits	: No data available

9.2. Other information

No additional information available.

SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reactions known under normal conditions of use.

10.2. Chemical stability

Stable under use and storage conditions as recommended in section 7.

10.3. Possibility of hazardous reactions

None known. Hazardous polymerization does not occur.

10.4. Conditions to avoid

Oxidants, reducing agents, alkali metals, bases.

10.5. Incompatible materials

Strong oxidizing agents.

10.6. Hazardous decomposition products

Carbon monoxide, carbon dioxides, hydrogen sulfide and sulfur oxides.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	: LD50 Oral – Rat – 400 mg/kg
Skin corrosion/irritation	: No data available
Serious eye damage/irritation	: No data available
Respiratory or skin sensitisation	: No data available
Germ cell mutagenicity	: No data available
Carcinogenicity	:
IARC	: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH	: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by AGIH.
NTP	: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by NTP.
OSHA	: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by OSHA.
Reproductive toxicity	: No data available
Specific target organ toxicity (single exposure)	: No data available
Specific target organ toxicity (repeated exposure)	: No data available
Aspiration hazard	: No data available
Symptoms/injuries after inhalation	: May cause upper respiratory irritation.
Symptoms/injuries after skin contact	: May cause skin irritation.
Symptoms/injuries after eye contact	: Direct contact with the eyes is likely to be irritating.
Symptoms/injuries after ingestion	: May cause gastrointestinal irritation.
Additional Information	: RTECS# XO8576500. Target organ is the central nervous system. Irritating to mucous membranes and upper respiratory tract. Exposure can cause nausea, headache, vomiting, and central nervous depression.

DTT (DL-Dithiothreitol), 100 mM.

Safety Data Sheet

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SECTION 12: Ecological information

12.1. Toxicity

No additional information available.

12.2. Persistence and degradability

No additional information available.

12.3. Bioaccumulative potential

No additional information available.

12.4. Mobility in soil

No additional information available.

12.5. Other adverse effects

No additional information available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Obtain the consent of pollution control authorities before discharging to wastewater treatment plants. Product should not be discharged to surface waters without a NPDES permit.

Waste disposal recommendations : Dispose in a safe manner in accordance with local, state, and federal regulations. Avoid release to the environment.

SECTION 14: Transport information

In accordance with DOT

Not hazardous for transport

Additional information

Other information : No supplementary information available.

Transport by sea

No additional information available

Air transport

No additional information available

SECTION 15: Regulatory information

15.1. US Federal regulations

SARA 302

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

15.2. International regulations

European Union Directive 67/548/EEC: Toxic R23/24/25. Toxic by inhalation, in contact with skin, and if swallowed. Irritant R36/37/38, irritant to eyes, respiratory system and skin. S26, in the case of eye contact, rinse immediately with plenty of water and consult a physician. S36/37/38, wear appropriate protective clothing, gloves, and face protection.

15.3. US State regulations

California Proposition 65

This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm.

Massachusetts Right To Know Components

No components are subject to the Massachusetts Right to Know Act.

New Jersey Right to Know Hazardous Substance List

DTT [(R*,R*)-1,4-Dimercaptobutane-2,3-diol], CAS 3483-12-35

Pennsylvania Right to Know List

DTT [(R*,R*)-1,4-Dimercaptobutane-2,3-diol], CAS 3483-12-35

DTT (DL-Dithiothreitol), 100 mM.

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SECTION 16: Other information

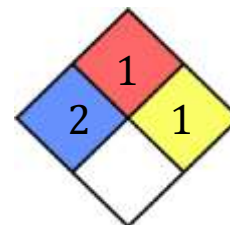
Indication of changes : Revision A: New SDS Created.
Revision date : 10/23/2017
Other information : Author: Lucigen Corporation

Acute toxicity, Oral (Category 4), H302
Skin irritation (Category 2), H315
Eye irritation (Category 2A), H319

H-Statements in section 2.

Acute Tox. : Acute toxicity.
Eye Irrit. : Eye irritation.
H302 : Harmful if swallowed.
H315 : Causes skin irritation.
H319 : Causes serious eye irritation.
Skin Irrit. : Skin Irritation.

NFPA health hazard : 2 – Intense or continued but not chronic exposure could cause temporary incapacitation or possible residual injury.
NFPA fire hazard : 1 – Flash point at or above 93.3°C.
NFPA reactivity : 1 – Normally stable, but can become unstable at elevated temperatures and pressures.



HMIS III Rating

Health : 2
Flammability : 0
Physical Hazard : 0
Personal Protection :

This information is disclosed to the best of Lucigen's knowledge. This document does not constitute a contractual relationship with product end users or handlers with respect to the possible presence of hazards in this item. Disposal should be in accordance with applicable regional, national and local laws and regulations.

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

1.1. Product identifier

Product name : 10X RT Reaction Buffer
 Product form : Mixture
 Product code : SS000737-D1, SS000737-D2, SS000373-D3

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

Use of the substance/mixture : Laboratory chemical, used in molecular biology experiments.

1.3. Details of the supplier of the safety data sheet

Lucigen Corporation
 2905 Parmenter Street
 Middleton, WI 53562
 U.S.A.
 Phone: (608) 831-9011
 Fax: (608) 831-9012
 E-mail: techserv@lucigen.com

1.4. Emergency telephone number

Emergency number : 1-888-575-9695 (Lucigen: Monday-Friday, 8:00AM-5:00PM)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification

Not a hazardous substance or mixture.

2.2. Label elements

GHS-US labelling elements, including precautionary statements

Not a hazardous substance or mixture.

2.3. Other hazards

None.

2.4. Unknown acute toxicity (GHS-US)

No data available.

SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product identifier	%
Tris Hydrochloride, CAS # 1185-53-1 EC# 214-684-5 Chemical Formula: C ₄ H ₁₁ NO ₃ Molecular Weight: 157.6 g/mol Synonyms: TRISHydrochloride, TRIS HCL, Tris(hydroxymethyl)aminomethane hydrochloride, 2-Amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride	Ingredient in product.	7.9
Potassium Chloride CAS# 7447-40-7 EC# 231-211-8 Chemical Formula KCl Molecular Weight 74.55 g/mol Synonyms: Potassium Salt, Diuretic Salt,	Ingredient in product.	5.6
Magnesium Chloride, CAS# 7768-30-3 EC# 232-094-6 Chemical Formula CL ₂ Mg Molecular Weight 95.21 g/mol	Ingredient in product.	0.29

Mixture contains no other hazardous ingredients at levels requiring disclosure by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : If exposed or concerned, consult a physician. Show this safety data sheet to the doctor in attendance. Wash contaminated clothing before re-use. Never give anything to an unconscious person.

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- First-aid measures after inhalation : IF INHALED: Remove to fresh air and keep at rest in a comfortable position for breathing. If not breathing, give artificial respiration. Consult a physician.
- First-aid measures after skin contact : IF ON SKIN (or clothing): Remove affected clothing and wash all exposed skin with soap for at least 15 minutes with tepid water. Consult a physician if irritation persists.
- First-aid measures after eye contact : IF IN EYES: Immediately flush with plenty of tepid water for at least 15 minutes. Remove contact lenses if present and easy to do so. Continue rinsing. Consult a physician if irritation persists.
- First-aid measures after ingestion : IF SWALLOWED: Rinse mouth thoroughly and consult a physician. Do not induce vomiting.

4.2. Most important symptoms and effects, both acute and delayed

- Symptoms/injuries : Not expected to present a significant acute hazard under anticipated conditions of normal use.
- Symptoms/injuries after inhalation : Can cause upper respiratory irritation.
- Symptoms/injuries after skin contact : Can cause skin irritation.
- Symptoms/injuries after eye contact : Can cause eye irritation, redness, and pain.
- Symptoms/injuries after ingestion : May cause gastrointestinal irritation and inflammatory reactions in the gastrointestinal tract.

4.3. Indication of any immediate medical attention and special treatment needed

No data available.

SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media : Water spray, carbon dioxide, dry chemical powder, alcohol-resistant foam, or appropriate foam.

5.2. Special hazards arising from the substance or mixture

- Fire hazard : May emit toxic fumes under fire conditions (hydrogen chloride gas, magnesium oxides, potassium oxides).
- Explosion hazard : May emit toxic fumes under fire conditions (hydrogen chloride gas, magnesium oxides, potassium oxides).
- Reactivity : No dangerous reactions known under normal conditions of use.

5.3. Advice for firefighters

- Firefighting instructions : Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
- Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- General measures : Ventilate area. Evacuate area. Keep upwind. Spill should be handled by trained clean-up crews properly equipped with respiratory equipment and full chemical protective gear (see Section 8). Avoid breathing in dust, vapour, or mist.

6.1.1. For non-emergency personnel

- Protective equipment : Wear Personal Protective Equipment as described in Section 8.

6.1.2. For emergency responders

- Protective equipment : Wear suitable protective clothing, gloves, respirator, and eye or face protection. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters drains, sewers or public waters. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

- For containment : Contain any spills with dikes or inert absorbents (e.g., sand or vermiculite) to prevent migration and entry into drains, sewers, or streams. Avoid creating and breathing in dust.
- Methods for cleaning up : Soak up spills with inert absorbants, such as sand or vermiculite as soon as possible. Place in closed waste container for disposal. This material and its container must be disposed of in a safe way, and as per local, state, and federal legislation.

6.4. Reference to other sections

No additional information available.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Precautions for safe handling : Do not handle until all safety precautions have been read and understood. Wear recommended personal protective equipment. Wash hands and other exposed areas with mild soap and water after handling material, leaving the laboratory, before eating, drinking or smoking and when leaving work. Avoid working in conditions that can lead to the formation of dust and aerosols.

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7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a -20°C freezer without a defrost cycle.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Components with workplace control parameters

Contains no substances with occupational exposure limits.

8.2. Exposure controls

Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Ensure adequate ventilation, especially in confined areas. Emergency safety shower and eye wash station should be available. Avoid prolonged or repeated exposure.

Personal protective equipment : Gloves. Protective goggles. Laboratory Coat.



Hand protection : Use gloves chemically resistant to this material when prolonged or repeated contact could occur. Gloves should be classified under Standard EN 374 or ASTM F1296. Suitable gloves for this specific application can be recommended by the glove supplier. Suggested glove materials are Nitrile.

Eye protection : Wear eye protection as needed. Avoid direct contact with eyes.

Skin and body protection : Wear chemically impervious PPE/coveralls to minimize bodily exposure as needed.

Respiratory protection : Use NIOSH/MSHA-approved dust/particulate respirator. Where vapor, mist, or dust exceed PELs or other applicable OELs, use NIOSH-approved respiratory protective equipment. Do not breathe in vapour, mist, or dust.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties of glycerol

Physical state	: Liquid
Color	: Colorless or white
Odor	: No data available
Odor Threshold	: No data available
pH	: No data available
Melting point	: No data available
Freezing point	: No data available
Boiling point	: No data available
Flash point	: No data available
Relative evaporation rate	: No data available
Flammability (solid, gas)	: No data available
Vapour pressure	: No data available
Relative vapour density at 20 °C	: No data available
Relative density	: No data available
Solubility in Water	: No data available
Log Pow	: No data available
Log Kow	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidising properties	: No data available
Explosive limits	: No data available

9.2. Other information

No other information available.

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SECTION 10: Stability and reactivity

10.1. Reactivity

No dangerous reactions known under normal conditions of use.

10.2. Chemical stability

Stable under use and storage conditions as recommended in section 7.

10.3. Possibility of hazardous reactions

None known.

10.4. Conditions to avoid

Exposure to moisture and heat.

10.5. Incompatible materials

Strong acids, strong bases, strong oxidizing agents.

10.6. Hazardous decomposition products

Hydrogen chloride gas, magnesium oxides, and potassium oxides may be produced in the event of a fire.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity	: LD50 Oral – Rat – > 5,000 mg/kg (Magnesium Chloride, OECD Test Guideline 423) : LD50 Dermal – Rat - > 2,000 mg/kg (Magnesium Chloride, OECD Test Guideline 402)
Skin corrosion/irritation	: No data available
Serious eye damage/irritation	: Rabbit – Mild eye irritation (Tris Hydrochloride)
Respiratory or skin sensitisation	: No data available
Germ cell mutagenicity	: No data available
Carcinogenicity	: IARC – No component of this product present at levels greater than or equal to 0.1% is identified as probably, possible, or confirmed human carcinogen by IARC. ACGIH – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH. NTP – No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP. OSHA – No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
Reproductive toxicity	: No data available
Specific target organ toxicity (single exposure)	: No data available
Specific target organ toxicity (repeated exposure)	: No data available
Aspiration hazard	: No data available
Symptoms/injuries after inhalation	: May cause upper respiratory irritation. May cause headaches.
Symptoms/injuries after skin contact	: May cause skin irritation.
Symptoms/injuries after eye contact	: Direct contact with the eyes is likely to be irritating.
Symptoms/injuries after ingestion	: May cause gastrointestinal irritation.
Additional Information	: Repeated dose toxicity – Rat – male and female – No observed adverse effect level - > 1,000 mg/kg. : RTECS: TS805000. Exposure to Potassium Chloride may cause nausea, vomiting, diarrhoea, constipation, abdominal pain, thirst, dizziness, rash, weakness, muscle cramps, visual changes. : RTECS: OM2800000. Exposure to Magnesium Chloride may cause central nervous system depression, diarrhoea, abdominal pain, stomach irregularities, and vomiting.

SECTION 12: Ecological information

12.1. Toxicity

Toxicity to fish	: LC50 – <i>Pimephales promelas</i> (fathead minnow) – 880 mg/L, 96 hours (Potassium Chloride) : Mortality NOEC - <i>Pimephales promelas</i> (fathead minnow) – 500 mg/L, 7 days (Potassium Chloride) : Mortality LOEC - <i>Pimephales promelas</i> (fathead minnow) – 1,000 mg/L, 7 days (Potassium Chloride) : Static test LC50 – <i>Pimephales promelas</i> (fathead minnow) – 2,119.3 mg/L, 96 hours (Magnesium Chloride)
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Toxicity to daphnia and other aquatic invertebrates	: EC50 – <i>Daphnia magna</i> (water flea) - > 440 mg/L, 48 hours (Potassium Chloride, OECD Test Guideline 202)
	: Static test LC50 - <i>Daphnia magna</i> (water flea) – 548.4 mg/L, 48 hours (Magnesium Chloride)
	: EC50 – <i>Daphnia magna</i> (water flea) - > 100 mg/L, 48 hours (Tris Chloride)
Toxicity to algae	: Growth inhibition EC50 – <i>Desmodesmus subspicatus</i> (<i>Scenedesmus subspicatus</i>) - > 100 mg/L, 72 hours (Magnesium Chloride, OECD Test Guideline 201)
	: EC50 – other microorganisms - > 1,000 mg/L, 3 hours (Tris Chloride)
Toxicity to bacteria	: Respiration inhibition EC50 – Sludge Treatment - > 900 mg/L, 3 hours (Magnesium Chloride, OECD Test Guideline 209)

12.2. Persistence and degradability

Tris HCl is readily biodegradable.

12.3. Bioaccumulative potential

Does not accumulate in organisms.

12.4. Mobility in soil

No additional information available.

12.5. Other adverse effects

No additional information available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : Obtain the consent of pollution control authorities before discharging to wastewater treatment plants. Product should not be discharged to surface waters without a NPDES permit. Contact a licensed professional waste disposal service to dispose of this mixture.

Waste disposal recommendations : Dispose in a safe manner in accordance with local, state, and federal regulations. Avoid releasing in to drains, sewers, and the environment.

SECTION 14: Transport information

In accordance with DOT

Not dangerous goods

For IMDG

Not dangerous goods

For IATA

Not dangerous goods

Additional information

Other information : No supplementary information available.

SECTION 15: Regulatory information

15.1. US Federal regulations

SARA 302

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 311/312 Hazards

No SARA Hazards

SARA 313

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

15.2. International regulations.

None.

15.3. US State regulations

California Proposition 65

This product does not contain any substances known to the state of California to cause cancer and/or reproductive harm.

Massachusetts Right To Know Components

No components are subject to the Massachusetts Right to Know Act.

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New Jersey Right to Know Hazardous Substance List

Magnesium Chloride, CAS 7786-30-3

Potassium Chloride, CAS 7447-40-7

2-Amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride, CAS 1185-53-1

Pennsylvania Right to Know List

Magnesium Chloride, CAS 7786-30-3

Potassium Chloride, CAS 7447-40-7

2-Amino-2-(hydroxymethyl)propane-1,3-diol hydrochloride, CAS 1185-53-1

SECTION 16: Other information

Indication of changes : Revision A: New SDS Created.

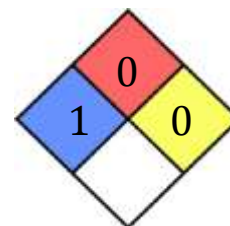
Revision date : 11/02/2017

Other information : Author: Lucigen Corporation

NFPA health hazard : 1 – Exposure would cause irritation with only minor residual injury.

NFPA fire hazard : 0 – Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand.

NFPA reactivity : 0 - Normally stable, even under fire exposure conditions, and is not reactive with water.



HMIS III Rating

Health : 1

Flammability : 0

Physical Hazard : 0

Personal Protection :

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