

SAFETY DATA SHEET

SureSelect Max Enzymatic Fragmentation Library Preparation Module, 16_96 Reactions

Section 1. Identification

Product identifier : SureSelect Max Enzymatic Fragmentation Library Preparation Module, 16_96 Reactions

Part no. (chemical kit) : 5280-0063, 5280-0064

Part no. : Frag/A-Tail Buffer 5271-0076 / 5271-0080
 Frag/A-Tail Enzyme Mix 5271-0077 / 5271-0081
 Ligation Master Mix 5271-0078 / 5271-0082
 Amplification Master Mix 5271-0079 / 5271-0083

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

Identified uses : Analytical reagent.
 For research use only.

Frag/A-Tail Buffer	0.072 ml (16 reactions) / 0.512 ml (96 reactions)
Frag/A-Tail Enzyme Mix	0.108 ml (16 reactions) / 0.768 ml (96 reactions)
Ligation Master Mix	0.36 ml (16 reactions) / 2.32 ml (96 reactions)
Amplification Master Mix	0.45 ml (16 reactions) / 2.84 ml (96 reactions)

Uses advised against : Not for use in diagnostic procedures.

Supplier/Manufacturer : Agilent Technologies, Inc.
 5301 Stevens Creek Blvd
 Santa Clara, CA 95051, USA
 800-227-9770

Emergency telephone number (with hours of operation) : CHEMTREC®: 1-800-424-9300

Section 2. Hazard identification

Classification of the substance or mixture

Frag/A-Tail Buffer

H302 ACUTE TOXICITY (oral) - Category 4
 H370 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) - Category 1
 H411 AQUATIC HAZARD (LONG-TERM) - Category 2

Frag/A-Tail Enzyme Mix

H320 EYE IRRITATION - Category 2B

Ligation Master Mix

H320 EYE IRRITATION - Category 2B

Amplification Master Mix

H302 ACUTE TOXICITY (oral) - Category 4
 H315 SKIN IRRITATION - Category 2
 H319 EYE IRRITATION - Category 2A
 H370 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) - Category 1
 H412 AQUATIC HAZARD (LONG-TERM) - Category 3

GHS label elements

Section 2. Hazard identification

Hazard pictograms : Frag/A-Tail Buffer



Amplification Master Mix



Signal word : Frag/A-Tail Buffer
Frag/A-Tail Enzyme Mix
Ligation Master Mix
Amplification Master Mix

Danger
Warning
Warning
Danger

Hazard statements : Frag/A-Tail Buffer

Frag/A-Tail Enzyme Mix
Ligation Master Mix
Amplification Master Mix

H302 - Harmful if swallowed.
H370 - Causes damage to organs. (central nervous system (CNS))
H411 - Toxic to aquatic life with long lasting effects.
H320 - Causes eye irritation.
H320 - Causes eye irritation.
H302 - Harmful if swallowed.
H315 - Causes skin irritation.
H319 - Causes serious eye irritation.
H370 - Causes damage to organs. (central nervous system (CNS))
H412 - Harmful to aquatic life with long lasting effects.

Precautionary statements

Prevention : Frag/A-Tail Buffer

Frag/A-Tail Enzyme Mix
Ligation Master Mix
Amplification Master Mix

P273 - Avoid release to the environment.
P260 - Do not breathe vapor.
P270 - Do not eat, drink or smoke when using this product.
P264 - Wash thoroughly after handling.
Not applicable.
Not applicable.
P280 - Wear protective gloves. Wear eye or face protection.
P273 - Avoid release to the environment.
P260 - Do not breathe vapor.
P270 - Do not eat, drink or smoke when using this product.
P264 - Wash thoroughly after handling.

Response : Frag/A-Tail Buffer

Frag/A-Tail Enzyme Mix

Ligation Master Mix

Amplification Master Mix

P391 - Collect spillage.
P308 + P311 - IF exposed or concerned: Call a POISON CENTER or doctor.
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.
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.
P308 + P311 - IF exposed or concerned: Call a POISON CENTER or doctor.
P362 + P364 - Take off contaminated clothing and wash it before reuse.

Section 2. Hazard identification

		P302 + P352 - IF ON SKIN: Wash with plenty of water. 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.
Storage	: Frag/A-Tail Buffer Frag/A-Tail Enzyme Mix Ligation Master Mix Amplification Master Mix	Not applicable. Not applicable. Not applicable. Not applicable.
Disposal	: Frag/A-Tail Buffer Frag/A-Tail Enzyme Mix Ligation Master Mix Amplification Master Mix	P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations. Not applicable. Not applicable. P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
Supplemental label elements	: Frag/A-Tail Buffer Frag/A-Tail Enzyme Mix Ligation Master Mix Amplification Master Mix Frag/A-Tail Buffer Frag/A-Tail Buffer	None known. None known. None known. None known. Percentage of the mixture consisting of ingredient(s) of unknown acute oral toxicity: 1 - 10% Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment: 1%
Other hazards which do not result in classification	: Frag/A-Tail Buffer Frag/A-Tail Enzyme Mix Ligation Master Mix Amplification Master Mix	None known. None known. None known. None known.

Section 3. Composition/information on ingredients

Substance/mixture	: Frag/A-Tail Buffer	Mixture
	Frag/A-Tail Enzyme Mix	Mixture
	Ligation Master Mix	Mixture
	Amplification Master Mix	Mixture

Ingredient name	Synonyms	% (w/w)	CAS number
Frag/A-Tail Buffer			
Magnesium chloride	Magnesium chloride	≥10 - ≤30	7786-30-3
tetramethylammonium chloride	tetramethylammonium chloride	≥5 - ≤10	75-57-0
Frag/A-Tail Enzyme Mix			
Glycerol	Glycerol	≥30 - ≤60	56-81-5
Ligation Master Mix			
Glycerol	Glycerol	≥30 - ≤60	56-81-5
Amplification Master Mix			
Glycerol	Glycerol	≥30 - ≤60	56-81-5

Section 3. Composition/information on ingredients

Trometamol	Tris	≥5 - ≤10	77-86-1
tetramethylammonium chloride	tetramethylammonium chloride	≥5 - ≤10	75-57-0

Ranges if listed above for hazardous ingredient(s) are prescribed ranges. The actual concentration(s) or actual concentration range(s) are being withheld as a trade secret.

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.

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

Section 4. First-aid measures

Description of necessary first aid measures

Eye contact	: Frag/A-Tail Buffer	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention. If necessary, call a poison center or physician.
	Frag/A-Tail Enzyme Mix	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.
	Ligation Master Mix	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.
	Amplification Master Mix	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention. If necessary, call a poison center or physician.
Inhalation	: Frag/A-Tail Buffer	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 necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
	Frag/A-Tail Enzyme Mix	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

Section 4. First-aid measures

	Ligation Master Mix	as a collar, tie, belt or waistband. 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.
	Amplification Master Mix	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 necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
Skin contact	: Frag/A-Tail Buffer	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. If necessary, call a poison center or physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.
	Frag/A-Tail Enzyme Mix	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.
	Ligation Master Mix	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.
	Amplification Master Mix	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. If necessary, call a poison center or physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.
Ingestion	: Frag/A-Tail Buffer	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 necessary, call a poison center or physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie,

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Frag/A-Tail Enzyme Mix	belt or waistband. 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.
Ligation Master Mix	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.
Amplification Master Mix	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 necessary, call a poison center or physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact	: Frag/A-Tail Buffer Frag/A-Tail Enzyme Mix Ligation Master Mix Amplification Master Mix	No known significant effects or critical hazards. Causes eye irritation. Causes eye irritation. Causes serious eye irritation.
Inhalation	: Frag/A-Tail Buffer Frag/A-Tail Enzyme Mix Ligation Master Mix Amplification Master Mix	Causes damage to organs following a single exposure if inhaled. No known significant effects or critical hazards. No known significant effects or critical hazards. Causes damage to organs following a single exposure if inhaled.

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Skin contact	: Frag/A-Tail Buffer	Causes damage to organs following a single exposure in contact with skin.
	Frag/A-Tail Enzyme Mix Ligation Master Mix Amplification Master Mix	No known significant effects or critical hazards. No known significant effects or critical hazards. Causes damage to organs following a single exposure in contact with skin. Causes skin irritation.
Ingestion	: Frag/A-Tail Buffer	Harmful if swallowed. Causes damage to organs following a single exposure if swallowed.
	Frag/A-Tail Enzyme Mix Ligation Master Mix Amplification Master Mix	No known significant effects or critical hazards. No known significant effects or critical hazards. Harmful if swallowed. Causes damage to organs following a single exposure if swallowed.
<u>Over-exposure signs/symptoms</u>		
Eye contact	: Frag/A-Tail Buffer	No specific data.
	Frag/A-Tail Enzyme Mix	Adverse symptoms may include the following: irritation watering redness
	Ligation Master Mix	Adverse symptoms may include the following: irritation watering redness
	Amplification Master Mix	Adverse symptoms may include the following: pain or irritation watering redness
Inhalation	: Frag/A-Tail Buffer	No specific data.
	Frag/A-Tail Enzyme Mix	No specific data.
	Ligation Master Mix	No specific data.
	Amplification Master Mix	No specific data.
Skin contact	: Frag/A-Tail Buffer	No specific data.
	Frag/A-Tail Enzyme Mix	No specific data.
	Ligation Master Mix	No specific data.
	Amplification Master Mix	Adverse symptoms may include the following: irritation redness
Ingestion	: Frag/A-Tail Buffer	No specific data.
	Frag/A-Tail Enzyme Mix	No specific data.
	Ligation Master Mix	No specific data.
	Amplification Master Mix	No specific data.

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

Notes to physician	: Frag/A-Tail Buffer	In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
	Frag/A-Tail Enzyme Mix	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
	Ligation Master Mix	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
	Amplification Master Mix	In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Section 4. First-aid measures

Specific treatments	: Frag/A-Tail Buffer	No specific treatment.
	Frag/A-Tail Enzyme Mix	No specific treatment.
	Ligation Master Mix	No specific treatment.
	Amplification Master Mix	No specific treatment.
Protection of first-aiders	: Frag/A-Tail Buffer	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.
	Frag/A-Tail Enzyme Mix	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.
	Ligation Master Mix	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.
	Amplification Master Mix	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.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media	: Frag/A-Tail Buffer	Use an extinguishing agent suitable for the surrounding fire.
	Frag/A-Tail Enzyme Mix	Use an extinguishing agent suitable for the surrounding fire.
	Ligation Master Mix	Use an extinguishing agent suitable for the surrounding fire.
	Amplification Master Mix	Use an extinguishing agent suitable for the surrounding fire.
Unsuitable extinguishing media	: Frag/A-Tail Buffer	None known.
	Frag/A-Tail Enzyme Mix	None known.
	Ligation Master Mix	None known.
	Amplification Master Mix	None known.
Specific hazards arising from the chemical	: Frag/A-Tail Buffer	In a fire or if heated, a pressure increase will occur and the container may burst. This material is toxic 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.
	Frag/A-Tail Enzyme Mix	In a fire or if heated, a pressure increase will occur and the container may burst.
	Ligation Master Mix	In a fire or if heated, a pressure increase will occur and the container may burst.
	Amplification Master Mix	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.

Section 5. Fire-fighting measures

Hazardous thermal decomposition products	: Frag/A-Tail Buffer	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides phosphorus oxides halogenated compounds metal oxide/oxides
	Frag/A-Tail Enzyme Mix	Decomposition products may include the following materials: carbon dioxide carbon monoxide
	Ligation Master Mix	Decomposition products may include the following materials: carbon dioxide carbon monoxide
	Amplification Master Mix	Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides halogenated compounds
Special protective actions for fire-fighters	: Frag/A-Tail Buffer	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.
	Frag/A-Tail Enzyme Mix	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.
	Ligation Master Mix	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.
	Amplification Master Mix	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	: Frag/A-Tail Buffer	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
	Frag/A-Tail Enzyme Mix	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
	Ligation Master Mix	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
	Amplification Master Mix	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	: Frag/A-Tail Buffer	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 spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
	Frag/A-Tail Enzyme Mix	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 spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
	Ligation Master Mix	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 spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
	Amplification Master Mix	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 spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
For emergency responders	: Frag/A-Tail Buffer	If specialized 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".
	Frag/A-Tail Enzyme Mix	If specialized 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".
	Ligation Master Mix	If specialized 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".
	Amplification Master Mix	If specialized 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	: Frag/A-Tail Buffer	Avoid dispersal of spilled 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. Collect spillage.
	Frag/A-Tail Enzyme Mix	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 6. Accidental release measures

Ligation Master Mix	Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Avoid dispersal of spilled 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).
Amplification Master Mix	Avoid dispersal of spilled 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 materials for containment and cleaning up

Methods for cleaning up	: Frag/A-Tail Buffer	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.
	Frag/A-Tail Enzyme Mix	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.
	Ligation Master Mix	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.
	Amplification Master Mix	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Section 7. Handling and storage

Precautions for safe handling

Protective measures	: Frag/A-Tail Buffer	Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapor 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.
	Frag/A-Tail Enzyme Mix	Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor or mist. Keep in the original container or an approved

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		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.
	Ligation Master Mix	Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapor 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.
	Amplification Master Mix	Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapor 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	: Frag/A-Tail Buffer	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.
	Frag/A-Tail Enzyme Mix	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.
	Ligation Master Mix	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.
	Amplification Master Mix	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.

Section 7. Handling and storage

Conditions for safe storage, including any incompatibilities : Frag/A-Tail Buffer

Frag/A-Tail Enzyme Mix	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 unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
Ligation Master Mix	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 unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
Amplification Master Mix	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 unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

[Control parameters](#)

[Occupational exposure limits](#)

Ingredient name	Exposure limits
Frag/A-Tail Enzyme Mix Glycerol	CA Alberta Provincial (Canada, 3/2023). OEL: 10 mg/m ³ 8 hours. Form: Mist CA Quebec Provincial (Canada, 9/2023). TWAEV: 10 mg/m ³ 8 hours. Form: mist CA Saskatchewan Provincial (Canada, 4/2021). STEL: 20 mg/m ³ 15 minutes. Form: mist

Section 8. Exposure controls/personal protection

<p>Ligation Master Mix Glycerol</p>	<p>TWA: 10 mg/m³ 8 hours. Form: mist CA British Columbia Provincial (Canada, 8/2023). TWA: 3 mg/m³ 8 hours. Form: respirable mist TWA: 10 mg/m³ 8 hours. Form: total mist</p> <p>CA Alberta Provincial (Canada, 3/2023). OEL: 10 mg/m³ 8 hours. Form: Mist CA Quebec Provincial (Canada, 9/2023). TWAEV: 10 mg/m³ 8 hours. Form: mist CA Saskatchewan Provincial (Canada, 4/2021). STEL: 20 mg/m³ 15 minutes. Form: mist TWA: 10 mg/m³ 8 hours. Form: mist CA British Columbia Provincial (Canada, 8/2023). TWA: 3 mg/m³ 8 hours. Form: respirable mist TWA: 10 mg/m³ 8 hours. Form: total mist</p>
<p>Amplification Master Mix Glycerol</p>	<p>CA Alberta Provincial (Canada, 3/2023). OEL: 10 mg/m³ 8 hours. Form: Mist CA Quebec Provincial (Canada, 9/2023). TWAEV: 10 mg/m³ 8 hours. Form: mist CA Saskatchewan Provincial (Canada, 4/2021). STEL: 20 mg/m³ 15 minutes. Form: mist TWA: 10 mg/m³ 8 hours. Form: mist CA British Columbia Provincial (Canada, 8/2023). TWA: 3 mg/m³ 8 hours. Form: respirable mist TWA: 10 mg/m³ 8 hours. Form: total mist</p>

Biological exposure indices

No exposure indices known.

Appropriate engineering controls

: If user operations generate dust, fumes, gas, vapor 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

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. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Section 8. Exposure controls/personal protection

- Eye/face protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles.
- Skin protection**
- Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties and safety characteristics

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

Appearance

Physical state	: Frag/A-Tail Buffer	Liquid.
	Frag/A-Tail Enzyme Mix	Liquid.
	Ligation Master Mix	Liquid.
	Amplification Master Mix	Liquid.
Color	: Frag/A-Tail Buffer	Not available.
	Frag/A-Tail Enzyme Mix	Not available.
	Ligation Master Mix	Not available.
	Amplification Master Mix	Not available.
Odor	: Frag/A-Tail Buffer	Not available.
	Frag/A-Tail Enzyme Mix	Not available.
	Ligation Master Mix	Not available.
	Amplification Master Mix	Not available.
Odor threshold	: Frag/A-Tail Buffer	Not available.
	Frag/A-Tail Enzyme Mix	Not available.
	Ligation Master Mix	Not available.
	Amplification Master Mix	Not available.
pH	: Frag/A-Tail Buffer	8.3
	Frag/A-Tail Enzyme Mix	7
	Ligation Master Mix	7.8
	Amplification Master Mix	8.5
Melting point/freezing point	: Frag/A-Tail Buffer	Not available.
	Frag/A-Tail Enzyme Mix	Not available.
	Ligation Master Mix	Not available.
	Amplification Master Mix	Not available.

Section 9. Physical and chemical properties and safety characteristics

Boiling point, initial boiling point, and boiling range : Frag/A-Tail Buffer Not available.
Frag/A-Tail Enzyme Mix Not available.
Ligation Master Mix Not available.
Amplification Master Mix Not available.

Flash point :

Ingredient name	Closed cup			Open cup		
	°C	°F	Method	°C	°F	Method
Frag/A-Tail Enzyme Mix						
Glycerol	-	-	-	177	350.6	-
Ligation Master Mix						
Glycerol	-	-	-	177	350.6	-
Amplification Master Mix						
Glycerol	-	-	-	177	350.6	-

Evaporation rate : Frag/A-Tail Buffer Not available.
Frag/A-Tail Enzyme Mix Not available.
Ligation Master Mix Not available.
Amplification Master Mix Not available.

Flammability : Frag/A-Tail Buffer Not applicable.
Frag/A-Tail Enzyme Mix Not applicable.
Ligation Master Mix Not applicable.
Amplification Master Mix Not applicable.

Lower and upper explosion limit/flammability limit : Frag/A-Tail Buffer Not available.
Frag/A-Tail Enzyme Mix Not available.
Ligation Master Mix Not available.
Amplification Master Mix Not available.

Vapor pressure :

Ingredient name	Vapor Pressure at 20°C			Vapor pressure at 50°C		
	mm Hg	kPa	Method	mm Hg	kPa	Method
Frag/A-Tail Buffer						
water	17.5	2.3	-	92.258	12.3	-
tetramethylammonium chloride	0.00000001	0.0000000013	EU A.4	-	-	-
Frag/A-Tail Enzyme Mix						
water	17.5	2.3	-	92.258	12.3	-
Glycerol	0.000075	0.00001	-	0.0025	0.00033	-
Ligation Master Mix						

Section 9. Physical and chemical properties and safety characteristics

water	17.5	2.3	-	92.258	12.3	-
Glycerol	0.000075	0.00001	-	0.0025	0.00033	-
Amplification Master Mix						
water	17.5	2.3	-	92.258	12.3	-
Trometamol	<0.00075006	<0.0001	-	-	-	-

Relative vapor density : Frag/A-Tail Buffer Not available.
Frag/A-Tail Enzyme Mix Not available.
Ligation Master Mix Not available.
Amplification Master Mix Not available.

Relative density : Frag/A-Tail Buffer Not available.
Frag/A-Tail Enzyme Mix Not available.
Ligation Master Mix Not available.
Amplification Master Mix Not available.

Solubility(ies) :

Media	Result
Frag/A-Tail Buffer	
water	Soluble
Frag/A-Tail Enzyme Mix	
water	Soluble
Ligation Master Mix	
water	Soluble
Amplification Master Mix	
water	Soluble

Partition coefficient: n-octanol/water : Frag/A-Tail Buffer Not applicable.
Frag/A-Tail Enzyme Mix Not applicable.
Ligation Master Mix Not applicable.
Amplification Master Mix Not applicable.

Auto-ignition temperature :

Ingredient name	°C	°F	Method
Frag/A-Tail Enzyme Mix			
Glycerol	370	698	-
Ligation Master Mix			
Glycerol	370	698	-
Amplification Master Mix			
Glycerol	370	698	-

Decomposition temperature : Frag/A-Tail Buffer Not available.
Frag/A-Tail Enzyme Mix Not available.
Ligation Master Mix Not available.
Amplification Master Mix Not available.

Viscosity : Frag/A-Tail Buffer Not available.
Frag/A-Tail Enzyme Mix Not available.
Ligation Master Mix Not available.
Amplification Master Mix Not available.

Particle characteristics

Section 9. Physical and chemical properties and safety characteristics

Median particle size	: Frag/A-Tail Buffer	Not applicable.
	Frag/A-Tail Enzyme Mix	Not applicable.
	Ligation Master Mix	Not applicable.
	Amplification Master Mix	Not applicable.

Section 10. Stability and reactivity

Reactivity	: Frag/A-Tail Buffer	No specific test data related to reactivity available for this product or its ingredients.
	Frag/A-Tail Enzyme Mix	No specific test data related to reactivity available for this product or its ingredients.
	Ligation Master Mix	No specific test data related to reactivity available for this product or its ingredients.
	Amplification Master Mix	No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	: Frag/A-Tail Buffer	The product is stable.
	Frag/A-Tail Enzyme Mix	The product is stable.
	Ligation Master Mix	The product is stable.
	Amplification Master Mix	The product is stable.
Possibility of hazardous reactions	: Frag/A-Tail Buffer	Under normal conditions of storage and use, hazardous reactions will not occur.
	Frag/A-Tail Enzyme Mix	Under normal conditions of storage and use, hazardous reactions will not occur.
	Ligation Master Mix	Under normal conditions of storage and use, hazardous reactions will not occur.
	Amplification Master Mix	Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	: Frag/A-Tail Buffer	No specific data.
	Frag/A-Tail Enzyme Mix	No specific data.
	Ligation Master Mix	No specific data.
	Amplification Master Mix	No specific data.
Incompatible materials	: Frag/A-Tail Buffer	May react or be incompatible with oxidizing materials.
	Frag/A-Tail Enzyme Mix	May react or be incompatible with oxidizing materials.
	Ligation Master Mix	May react or be incompatible with oxidizing materials.
	Amplification Master Mix	May react or be incompatible with oxidizing materials.
Hazardous decomposition products	: Frag/A-Tail Buffer	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	Frag/A-Tail Enzyme Mix	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	Ligation Master Mix	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
	Amplification Master Mix	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Frag/A-Tail Buffer Magnesium chloride	LD50 Dermal	Rat - Male, Female	>2000 mg/kg	-
tetramethylammonium chloride	LD50 Oral	Rat	2800 mg/kg	-
	LD50 Dermal	Rabbit - Male, Female	200 to 500 mg/ kg	-
	LD50 Oral	Rat	50 mg/kg	-
Frag/A-Tail Enzyme Mix Glycerol	LD50 Oral	Rat	12600 mg/kg	-
Ligation Master Mix Glycerol	LD50 Oral	Rat	12600 mg/kg	-
Amplification Master Mix Glycerol Trometamol tetramethylammonium chloride	LD50 Oral	Rat	12600 mg/kg	-
	LD50 Dermal	Rat	>5000 mg/kg	-
	LD50 Dermal	Rabbit - Male, Female	200 to 500 mg/ kg	-
	LD50 Oral	Rat	50 mg/kg	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Frag/A-Tail Enzyme Mix Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
Ligation Master Mix Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
Amplification Master Mix Glycerol	Eyes - Mild irritant	Rabbit	-	24 hours 500 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
Trometamol	Skin - Moderate irritant	Rabbit	-	25 %	-
	Skin - Severe irritant	Rabbit	-	500 mg	-

Sensitization

Not available.

Mutagenicity

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Teratogenicity

Section 11. Toxicological information

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
Frag/A-Tail Buffer tetramethylammonium chloride	Category 1	oral	central nervous system (CNS)
Amplification Master Mix Trometamol	Category 3	-	Respiratory tract irritation
tetramethylammonium chloride	Category 1	oral	central nervous system (CNS)

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure	: Frag/A-Tail Buffer	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
	Frag/A-Tail Enzyme Mix	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
	Ligation Master Mix	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
	Amplification Master Mix	Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.

Potential acute health effects

Eye contact	: Frag/A-Tail Buffer	No known significant effects or critical hazards.
	Frag/A-Tail Enzyme Mix	Causes eye irritation.
	Ligation Master Mix	Causes eye irritation.
	Amplification Master Mix	Causes serious eye irritation.
Inhalation	: Frag/A-Tail Buffer	Causes damage to organs following a single exposure if inhaled.
	Frag/A-Tail Enzyme Mix	No known significant effects or critical hazards.
	Ligation Master Mix	No known significant effects or critical hazards.
	Amplification Master Mix	Causes damage to organs following a single exposure if inhaled.
Skin contact	: Frag/A-Tail Buffer	Causes damage to organs following a single exposure in contact with skin.
	Frag/A-Tail Enzyme Mix	No known significant effects or critical hazards.
	Ligation Master Mix	No known significant effects or critical hazards.
	Amplification Master Mix	Causes damage to organs following a single exposure in contact with skin. Causes skin irritation.
Ingestion	: Frag/A-Tail Buffer	Harmful if swallowed. Causes damage to organs following a single exposure if swallowed.
	Frag/A-Tail Enzyme Mix	No known significant effects or critical hazards.
	Ligation Master Mix	No known significant effects or critical hazards.
	Amplification Master Mix	Harmful if swallowed. Causes damage to organs following a single exposure if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics

Section 11. Toxicological information

Eye contact	: Frag/A-Tail Buffer	No specific data.
	Frag/A-Tail Enzyme Mix	Adverse symptoms may include the following: irritation watering redness
	Ligation Master Mix	Adverse symptoms may include the following: irritation watering redness
	Amplification Master Mix	Adverse symptoms may include the following: pain or irritation watering redness
Inhalation	: Frag/A-Tail Buffer	No specific data.
	Frag/A-Tail Enzyme Mix	No specific data.
	Ligation Master Mix	No specific data.
	Amplification Master Mix	No specific data.
Skin contact	: Frag/A-Tail Buffer	No specific data.
	Frag/A-Tail Enzyme Mix	No specific data.
	Ligation Master Mix	No specific data.
	Amplification Master Mix	Adverse symptoms may include the following: irritation redness
Ingestion	: Frag/A-Tail Buffer	No specific data.
	Frag/A-Tail Enzyme Mix	No specific data.
	Ligation Master Mix	No specific data.
	Amplification Master Mix	No specific data.

Delayed and immediate effects and also 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 : Frag/A-Tail Buffer No known significant effects or critical hazards.
Frag/A-Tail Enzyme Mix No known significant effects or critical hazards.
Ligation Master Mix No known significant effects or critical hazards.
Amplification Master Mix No known significant effects or critical hazards.

Carcinogenicity : Frag/A-Tail Buffer No known significant effects or critical hazards.
Frag/A-Tail Enzyme Mix No known significant effects or critical hazards.
Ligation Master Mix No known significant effects or critical hazards.
Amplification Master Mix No known significant effects or critical hazards.

Mutagenicity : Frag/A-Tail Buffer No known significant effects or critical hazards.
Frag/A-Tail Enzyme Mix No known significant effects or critical hazards.
Ligation Master Mix No known significant effects or critical hazards.
Amplification Master Mix No known significant effects or critical hazards.

Reproductive toxicity : Frag/A-Tail Buffer No known significant effects or critical hazards.
Frag/A-Tail Enzyme Mix No known significant effects or critical hazards.
Ligation Master Mix No known significant effects or critical hazards.
Amplification Master Mix No known significant effects or critical hazards.

Section 11. Toxicological information

Numerical measures of toxicity

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapors) (mg/l)	Inhalation (dusts and mists) (mg/l)
Frag/A-Tail Buffer					
Frag/A-Tail Buffer	965.5	4838.7	N/A	N/A	N/A
Magnesium chloride	2800	2500	N/A	N/A	N/A
tetramethylammonium chloride	50	300	N/A	N/A	N/A
Frag/A-Tail Enzyme Mix					
Glycerol	12600	N/A	N/A	N/A	N/A
Ligation Master Mix					
Glycerol	12600	N/A	N/A	N/A	N/A
Amplification Master Mix					
Amplification Master Mix	1279.5	7677.0	N/A	N/A	N/A
Glycerol	12600	N/A	N/A	N/A	N/A
tetramethylammonium chloride	50	300	N/A	N/A	N/A

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Frag/A-Tail Buffer			
Magnesium chloride	Acute EC50 >100 mg/l Fresh water	Algae - <i>Desmodesmus subspicatus</i>	72 hours
	Acute EC50 180000 µg/l Fresh water	Crustaceans - <i>Eudiaptomus padanus</i> ssp. <i>padanus</i> - Adult	48 hours
	Acute IC50 6.8 mg/l Fresh water	Aquatic plants - <i>Lemna aequinoctialis</i>	96 hours
	Acute LC50 32000 µg/l Fresh water	Daphnia - <i>Daphnia hyalina</i> - Adult	48 hours
	Acute LC50 2120 mg/l Fresh water	Fish - <i>Pimephales promelas</i>	96 hours
	Acute NOEC 100 mg/l Fresh water	Algae - <i>Desmodesmus subspicatus</i>	72 hours
tetramethylammonium chloride	Chronic NOEC 0.1 mg/l Fresh water	Fish - <i>Cyprinus carpio</i>	35 days
	Acute LC50 462 mg/l Fresh water	Fish - <i>Pimephales promelas</i>	96 hours
Frag/A-Tail Enzyme Mix			
Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - <i>Oncorhynchus mykiss</i>	96 hours
Ligation Master Mix			
Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - <i>Oncorhynchus mykiss</i>	96 hours
Amplification Master Mix			
Glycerol	Acute LC50 54000 mg/l Fresh water	Fish - <i>Oncorhynchus mykiss</i>	96 hours
Trometamol	Acute EC50 >980 mg/l Fresh water	Daphnia	48 hours
	Acute NOEC 520 mg/l Fresh water	Daphnia	48 hours
tetramethylammonium chloride	Acute LC50 462 mg/l Fresh water	Fish - <i>Pimephales promelas</i>	96 hours

Section 12. Ecological information

Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
Frag/A-Tail Enzyme Mix Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-
Ligation Master Mix Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-
Amplification Master Mix Glycerol	301D Ready Biodegradability - Closed Bottle Test	93 % - 30 days	-	-
Trometamol	OECD 301F Ready Biodegradability - Manometric Respirometry Test	97.1 % - Readily - 28 days	30 mg/l	-

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Frag/A-Tail Buffer tetramethylammonium chloride	-	-	Readily
Amplification Master Mix Trometamol tetramethylammonium chloride	- -	- -	Readily Readily

Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
Frag/A-Tail Buffer tetramethylammonium chloride	<-1.6	-	Low
Frag/A-Tail Enzyme Mix Glycerol	-1.76	-	Low
Ligation Master Mix Glycerol	-1.76	-	Low
Amplification Master Mix Glycerol Trometamol tetramethylammonium chloride	-1.76 -2.31 <-1.6	- - -	Low Low Low

Mobility in soil

Section 12. Ecological information

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

Section 14. Transport information

TDG / IMDG / IATA : Not regulated.

Additional information

Remarks: De minimis quantities

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

Canadian lists

Canadian NPRI : None of the components are listed.

CEPA Toxic substances : None of the components are listed.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

Canada : Not determined.

Section 15. Regulatory information

United States : Not determined.

Section 16. Other information

History

Date of issue/Date of revision : 09/11/2024

Date of previous issue : 05/31/2024

Version : 1.1

Key to abbreviations : ATE = Acute Toxicity Estimate
 BCF = Bioconcentration Factor
 GHS = Globally Harmonized System of Classification and Labelling of Chemicals
 HPR = Hazardous Products Regulations
 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
 UN = United Nations

Procedure used to derive the classification

Classification	Justification
Frag/A-Tail Buffer ACUTE TOXICITY (oral) - Category 4 SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) - Category 1 AQUATIC HAZARD (LONG-TERM) - Category 2	Calculation method Calculation method Calculation method
Frag/A-Tail Enzyme Mix EYE IRRITATION - Category 2B	Calculation method
Ligation Master Mix EYE IRRITATION - Category 2B	Calculation method
Amplification Master Mix ACUTE TOXICITY (oral) - Category 4 SKIN IRRITATION - Category 2 EYE IRRITATION - Category 2A SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) - Category 1 AQUATIC HAZARD (LONG-TERM) - Category 3	Calculation method Calculation method Calculation method Calculation method Calculation method

✓ Indicates information that has changed from previously issued version.

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