Section 1. Identification

1.1 Product identifier
Product name : pDual GC Expression Vector, Part Number 214503
Part no. (chemical kit) : 214503
Part no. : pDual GC Expression Vector 214503-51
XL1-Blue MRF’ E.coli Strain 200301-81
Validation date : 9/25/2018

1.2 Relevant identified uses of the substance or mixture and uses advised against
Material uses : Analytical reagent.
pDual GC Expression Vector 0.02 ml (20 µg 1 µg/µl)
XL1-Blue MRF’ E.coli Strain 0.5 ml

1.3 Details of the supplier of the safety data sheet
Supplier/Manufacturer : Agilent Technologies, Inc.
5301 Stevens Creek Blvd
Santa Clara, CA 95051, USA
800-227-9770

1.4 Emergency telephone number
In case of emergency : CHEMTREC®: 1-800-424-9300

Section 2. Hazards identification

2.1 Classification of the substance or mixture
OSHA/HCS status : pDual GC Expression Vector
While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

XL1-Blue MRF’ E.coli Strain
This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture
XL1-Blue MRF’ E.coli Strain
H319 EYE IRRITATION - Category 2A

Ingredients of unknown toxicity : XL1-Blue MRF’ E.coli Strain
Percentage of the mixture consisting of ingredient(s) of unknown inhalation toxicity: 10 - 30%

2.2 GHS label elements
Hazard pictograms : XL1-Blue MRF’ E.coli Strain

Signal word : pDual GC Expression Vector
XL1-Blue MRF’ E.coli Strain
No signal word.
Warning

Hazard statements : pDual GC Expression Vector
XL1-Blue MRF’ E.coli Strain
No known significant effects or critical hazards.
H319 - Causes serious eye irritation.
Section 2. Hazards identification

Precautionary statements

Prevention : pDual GC Expression Vector Not applicable.
             XL1-Blue MRF' E.coli Strain
             P280 - Wear eye or face protection.
             P264 - Wash hands thoroughly after handling.

Response : pDual GC Expression Vector Not applicable.
             XL1-Blue MRF' E.coli Strain
             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 attention.

Storage : pDual GC Expression Vector Not applicable.
          XL1-Blue MRF' E.coli Strain
          Not applicable.

Disposal : pDual GC Expression Vector Not applicable.
           XL1-Blue MRF' E.coli Strain
           Not applicable.

Supplemental label elements : pDual GC Expression Vector None known.
                              XL1-Blue MRF' E.coli Strain
                              None known.

2.3 Other hazards

Hazards not otherwise classified : pDual GC Expression Vector None known.
                                   XL1-Blue MRF' E.coli Strain None known.

Section 3. Composition/information on ingredients

Substance/mixture : pDual GC Expression Vector Mixture
                    XL1-Blue MRF' E.coli Strain Mixture

<table>
<thead>
<tr>
<th>Ingredient name</th>
<th>%</th>
<th>CAS number</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL1-Blue MRF' E.coli Strain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycerol</td>
<td>≥10 - ≤25</td>
<td>56-81-5</td>
</tr>
<tr>
<td>Sodium chloride</td>
<td>≤3</td>
<td>7647-14-5</td>
</tr>
</tbody>
</table>

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

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

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

Section 4. First aid measures

4.1 Description of necessary first aid measures

Eye contact : pDual GC Expression Vector
              XL1-Blue MRF' E.coli Strain
              Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.

          : XL1-Blue MRF' E.coli Strain
              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.

Date of issue : 09/25/2018
### Section 4. First aid measures

**Inhalation**

<table>
<thead>
<tr>
<th>Product</th>
<th>First Aid Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>pDual GC Expression Vector</td>
<td>Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.</td>
</tr>
<tr>
<td>XL1-Blue MRF’ E.coli Strain</td>
<td>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.</td>
</tr>
</tbody>
</table>

**Skin contact**

<table>
<thead>
<tr>
<th>Product</th>
<th>First Aid Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>pDual GC Expression Vector</td>
<td>Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.</td>
</tr>
<tr>
<td>XL1-Blue MRF’ E.coli Strain</td>
<td>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.</td>
</tr>
</tbody>
</table>

**Ingestion**

<table>
<thead>
<tr>
<th>Product</th>
<th>First Aid Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>pDual GC Expression Vector</td>
<td>Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.</td>
</tr>
<tr>
<td>XL1-Blue MRF’ E.coli Strain</td>
<td>Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been 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.</td>
</tr>
</tbody>
</table>

#### 4.2 Most important symptoms/effects, acute and delayed

**Potential acute health effects**

<table>
<thead>
<tr>
<th>Contact Type</th>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye contact</td>
<td>pDual GC Expression Vector</td>
<td>No known significant effects or critical hazards. Causes serious eye irritation.</td>
</tr>
<tr>
<td></td>
<td>XL1-Blue MRF’ E.coli Strain</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>Inhalation</td>
<td>pDual GC Expression Vector</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td></td>
<td>XL1-Blue MRF’ E.coli Strain</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>Skin contact</td>
<td>pDual GC Expression Vector</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td></td>
<td>XL1-Blue MRF’ E.coli Strain</td>
<td>No known significant effects or critical hazards.</td>
</tr>
</tbody>
</table>

**Date of issue**: 09/25/2018
Section 4. First aid measures

Ingestion

pDual GC Expression Vector
XL1-Blue MRF’ E.coli Strain
No known significant effects or critical hazards.

XL1-Blue MRF’ E.coli Strain
No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact

pDual GC Expression Vector
XL1-Blue MRF’ E.coli Strain
No specific data.

XL1-Blue MRF’ E.coli Strain
Adverse symptoms may include the following:
- pain or irritation
- watering
- redness

Inhalation

pDual GC Expression Vector
XL1-Blue MRF’ E.coli Strain
No specific data.

XL1-Blue MRF’ E.coli Strain
No specific data.

Skin contact

pDual GC Expression Vector
XL1-Blue MRF’ E.coli Strain
No specific data.

XL1-Blue MRF’ E.coli Strain
No specific data.

Ingestion

pDual GC Expression Vector
XL1-Blue MRF’ E.coli Strain
No specific data.

XL1-Blue MRF’ E.coli Strain
No specific data.

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

Notes to physician

pDual GC Expression Vector
XL1-Blue MRF’ E.coli Strain
Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

pDual GC Expression Vector
XL1-Blue MRF’ E.coli Strain
Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments

pDual GC Expression Vector
XL1-Blue MRF’ E.coli Strain
No specific treatment.

XL1-Blue MRF’ E.coli Strain
No specific treatment.

Protection of first-aiders

pDual GC Expression Vector
XL1-Blue MRF’ E.coli Strain
No action shall be taken involving any personal risk or without suitable training.

XL1-Blue MRF’ E.coli Strain
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

5.1 Extinguishing media

Suitable extinguishing media

pDual GC Expression Vector
XL1-Blue MRF’ E.coli Strain
Use an extinguishing agent suitable for the surrounding fire.

pDual GC Expression Vector
XL1-Blue MRF’ E.coli Strain
Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media

pDual GC Expression Vector
XL1-Blue MRF’ E.coli Strain
None known.

XL1-Blue MRF’ E.coli Strain
None known.

5.2 Special hazards arising from the substance or mixture

Specific hazards arising from the chemical

pDual GC Expression Vector
XL1-Blue MRF’ E.coli Strain
In a fire or if heated, a pressure increase will occur and the container may burst.

pDual GC Expression Vector
XL1-Blue MRF’ E.coli Strain
In a fire or if heated, a pressure increase will occur and the container may burst.
## Section 5. Fire-fighting measures

**Hazardous thermal decomposition products**

<table>
<thead>
<tr>
<th></th>
<th>pDual GC Expression Vector</th>
<th>XL1-Blue MRF’ E.coli Strain</th>
</tr>
</thead>
<tbody>
<tr>
<td>No specific data.</td>
<td></td>
<td>Decomposition products may include the following materials:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>carbon dioxide</td>
</tr>
<tr>
<td></td>
<td></td>
<td>carbon monoxide</td>
</tr>
<tr>
<td></td>
<td></td>
<td>halogenated compounds</td>
</tr>
<tr>
<td></td>
<td></td>
<td>metal oxide/oxides</td>
</tr>
</tbody>
</table>

### 5.3 Advice for firefighters

**Special protective actions for fire-fighters**

- 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**

- 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

### 6.1 Personal precautions, protective equipment and emergency procedures

**For non-emergency personnel**

- 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. Put on appropriate personal protective equipment.

**For emergency responders**

- 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".

### Date of issue

09/25/2018
Section 6. Accidental release measures

6.2 Environmental precautions

<table>
<thead>
<tr>
<th>pDual GC Expression Vector</th>
<th>pDual GC Expression Vector</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL1-Blue MRF’ E.coli Strain</td>
<td>XL1-Blue MRF’ E.coli Strain</td>
</tr>
</tbody>
</table>

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).

6.3 Methods and materials for containment and cleaning up

<table>
<thead>
<tr>
<th>Methods for cleaning up</th>
<th>pDual GC Expression Vector</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL1-Blue MRF’ E.coli Strain</td>
<td>XL1-Blue MRF’ E.coli Strain</td>
</tr>
</tbody>
</table>

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

7.1 Precautions for safe handling

<table>
<thead>
<tr>
<th>Protective measures</th>
<th>pDual GC Expression Vector</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL1-Blue MRF’ E.coli Strain</td>
<td>XL1-Blue MRF’ E.coli Strain</td>
</tr>
</tbody>
</table>

Put on appropriate personal protective equipment (see Section 6).

<table>
<thead>
<tr>
<th>Advice on general occupational hygiene</th>
<th>pDual GC Expression Vector</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL1-Blue MRF’ E.coli Strain</td>
<td>XL1-Blue MRF’ E.coli Strain</td>
</tr>
</tbody>
</table>

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities

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Section 7. Handling and storage

pDual GC Expression Vector
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.

XL1-Blue MRF' E.coli Strain
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.

Section 8. Exposure controls/personal protection

8.1 Control parameters

Ingredient name | Exposure limits
--- | ---
XL1-Blue MRF' E.coli Strain Glycerol | OSHA PEL 1989 (United States, 3/1989). TWA: 5 mg/m³ 8 hours. Form: Respirable fraction TWA: 10 mg/m³ 8 hours. Form: Total dust

OSHA PEL (United States, 6/2016). TWA: 5 mg/m³ 8 hours. Form: Respirable fraction TWA: 15 mg/m³ 8 hours. Form: Total dust None.

Sodium chloride

8.2 Exposure controls

Appropriate engineering controls: Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

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

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Section 8. Exposure controls/personal protection

Hygiene measures: Handle as biohazard material (Biosafety level 1). Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

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.

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

9.1 Information on basic physical and chemical properties

Appearance

Physical state: pDual GC Expression Vector Liquid. XL1-Blue MRF' E.coli Strain Liquid.

Color: pDual GC Expression Vector Not available. XL1-Blue MRF' E.coli Strain Not available.

Odor: pDual GC Expression Vector Not available. XL1-Blue MRF' E.coli Strain Not available.

Odor threshold: pDual GC Expression Vector Not available. XL1-Blue MRF' E.coli Strain Not available.

pH: pDual GC Expression Vector 7.5 XL1-Blue MRF' E.coli Strain 7

Melting point: pDual GC Expression Vector 0°C (32°F) XL1-Blue MRF' E.coli Strain Not available.

Boiling point: pDual GC Expression Vector 100°C (212°F) XL1-Blue MRF' E.coli Strain Not available.

Flash point: pDual GC Expression Vector Not available. XL1-Blue MRF' E.coli Strain Not available.

Evaporation rate: pDual GC Expression Vector Not available. XL1-Blue MRF' E.coli Strain Not available.

Flammability (solid, gas): pDual GC Expression Vector Not applicable. XL1-Blue MRF' E.coli Strain Not applicable.

Lower and upper explosive (flammable) limits: pDual GC Expression Vector Not available. XL1-Blue MRF' E.coli Strain Not available.

Vapor pressure: pDual GC Expression Vector Not available. XL1-Blue MRF' E.coli Strain Not available.
**Section 9. Physical and chemical properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>pDual GC Expression Vector</th>
<th>XL1-Blue MRF' E.coli Strain</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vapor density</strong></td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Relative density</strong></td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Solubility</strong></td>
<td>Easily soluble in the following materials: cold water and hot water.</td>
<td>Soluble in the following materials: cold water and hot water.</td>
</tr>
<tr>
<td><strong>Partition coefficient: n-octanol/water</strong></td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Auto-ignition temperature</strong></td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Decomposition temperature</strong></td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Viscosity</strong></td>
<td>Not available.</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

**Section 10. Stability and reactivity**

10.1 **Reactivity**

- pDual GC Expression Vector
- XL1-Blue MRF' E.coli Strain

No specific test data related to reactivity available for this product or its ingredients.

10.2 **Chemical stability**

- pDual GC Expression Vector
- XL1-Blue MRF' E.coli Strain

The product is stable.

10.3 **Possibility of hazardous reactions**

- pDual GC Expression Vector
- XL1-Blue MRF' E.coli Strain

Under normal conditions of storage and use, hazardous reactions will not occur.

10.4 **Conditions to avoid**

- pDual GC Expression Vector
- XL1-Blue MRF' E.coli Strain

No specific data.

10.5 **Incompatible materials**

- pDual GC Expression Vector
- XL1-Blue MRF' E.coli Strain

May react or be incompatible with oxidizing materials.

10.6 **Hazardous decomposition products**

- pDual GC Expression Vector
- XL1-Blue MRF' E.coli Strain

Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Section 11. Toxicological information

11.1 Information on toxicological effects

**Acute toxicity**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Dose</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL1-Blue MRF' E.coli Strain</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycerol</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>12600 mg/kg</td>
<td>-</td>
</tr>
<tr>
<td>Sodium chloride</td>
<td>LD50 Oral</td>
<td>Rat</td>
<td>3000 mg/kg</td>
<td>-</td>
</tr>
</tbody>
</table>

**Irritation/Corrosion**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Score</th>
<th>Exposure</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL1-Blue MRF' E.coli Strain</td>
<td>Eyes - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 500 milligrams</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Skin - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 500 milligrams</td>
<td>-</td>
</tr>
<tr>
<td>Glycerol</td>
<td>Eyes - Moderate irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 100 milligrams</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Skin - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>24 hours 500 milligrams</td>
<td>-</td>
</tr>
<tr>
<td>Sodium chloride</td>
<td>Eyes - Moderate irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>10 milligrams</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Skin - Mild irritant</td>
<td>Rabbit</td>
<td>-</td>
<td>500 milligrams</td>
<td></td>
</tr>
</tbody>
</table>

**Sensitization**

Not available.

**Mutagenicity**

Conclusion/Summary : Not available.

**Carcinogenicity**

Conclusion/Summary : Not available.

**Reproductive toxicity**

Conclusion/Summary : Not available.

**Teratogenicity**

Conclusion/Summary : Not available.

**Specific target organ toxicity (single exposure)**

Not available.

**Specific target organ toxicity (repeated exposure)**

Not available.

**Aspiration hazard**

Not available.

**Information on the likely routes of exposure**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Not available.</th>
</tr>
</thead>
<tbody>
<tr>
<td>pDual GC Expression Vector</td>
<td>Routes of entry anticipated: Oral, Dermal, Inhalation.</td>
</tr>
<tr>
<td>XL1-Blue MRF' E.coli Strain</td>
<td></td>
</tr>
</tbody>
</table>

**Potential acute health effects**

**Eye contact**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Not available.</th>
</tr>
</thead>
<tbody>
<tr>
<td>pDual GC Expression Vector</td>
<td>Causes serious eye irritation.</td>
</tr>
<tr>
<td>XL1-Blue MRF' E.coli Strain</td>
<td></td>
</tr>
</tbody>
</table>

**Inhalation**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Not available.</th>
</tr>
</thead>
<tbody>
<tr>
<td>pDual GC Expression Vector</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>XL1-Blue MRF' E.coli Strain</td>
<td></td>
</tr>
</tbody>
</table>

**Skin contact**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Not available.</th>
</tr>
</thead>
<tbody>
<tr>
<td>pDual GC Expression Vector</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>XL1-Blue MRF' E.coli Strain</td>
<td></td>
</tr>
</tbody>
</table>

**Ingestion**

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Not available.</th>
</tr>
</thead>
<tbody>
<tr>
<td>pDual GC Expression Vector</td>
<td>No known significant effects or critical hazards.</td>
</tr>
<tr>
<td>XL1-Blue MRF' E.coli Strain</td>
<td></td>
</tr>
</tbody>
</table>

**Date of issue :** 09/25/2018
Section 11. Toxicological information

Symptoms related to the physical, chemical and toxicological characteristics

**Eye contact**
- pDual GC Expression Vector: No specific data.
- XL1-Blue MRF’ E.coli Strain: Adverse symptoms may include the following:
  - pain or irritation
  - watering
  - redness

**Inhalation**
- pDual GC Expression Vector: No specific data.
- XL1-Blue MRF’ E.coli Strain: No specific data.

**Skin contact**
- pDual GC Expression Vector: No specific data.
- XL1-Blue MRF’ E.coli Strain: No specific data.

**Ingestion**
- pDual GC Expression Vector: No specific data.
- XL1-Blue MRF’ E.coli Strain: 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**
- pDual GC Expression Vector: No known significant effects or critical hazards.
- XL1-Blue MRF’ E.coli Strain: No known significant effects or critical hazards.

**Carcinogenicity**
- pDual GC Expression Vector: No known significant effects or critical hazards.
- XL1-Blue MRF’ E.coli Strain: No known significant effects or critical hazards.

**Mutagenicity**
- pDual GC Expression Vector: No known significant effects or critical hazards.
- XL1-Blue MRF’ E.coli Strain: No known significant effects or critical hazards.

**Teratogenicity**
- pDual GC Expression Vector: No known significant effects or critical hazards.
- XL1-Blue MRF’ E.coli Strain: No known significant effects or critical hazards.

**Developmental effects**
- pDual GC Expression Vector: No known significant effects or critical hazards.
- XL1-Blue MRF’ E.coli Strain: No known significant effects or critical hazards.

**Fertility effects**
- pDual GC Expression Vector: No known significant effects or critical hazards.
- XL1-Blue MRF’ E.coli Strain: No known significant effects or critical hazards.

Numerical measures of toxicity

**Acute toxicity estimates**

<table>
<thead>
<tr>
<th>Route</th>
<th>ATE value</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL1-Blue MRF’ E.coli Strain</td>
<td>300000 mg/kg</td>
</tr>
</tbody>
</table>

Date of issue: 09/25/2018
Section 12. Ecological information

12.1 Toxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL1-Blue MRF® E.coli Strain</td>
<td>Acute LC50 54000 mg/l Fresh water</td>
<td>Fish - Oncorhynchus mykiss</td>
<td>96 hours</td>
</tr>
<tr>
<td>Glycerol</td>
<td>Acute EC50 4.74 g/L Fresh water</td>
<td>Algae - Chlamydomonas reinhardtii</td>
<td>96 hours</td>
</tr>
<tr>
<td>Sodium chloride</td>
<td>Acute EC50 519.6 mg/l Fresh water</td>
<td>Crustaceans - Cypris subglobosa</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute EC50 402600 µg/l Fresh water</td>
<td>Daphnia - Daphnia magna</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>Acute IC50 6.87 g/L Fresh water</td>
<td>Aquatic plants - Lemna minor</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Acute LC50 1000000 µg/l Fresh water</td>
<td>Fish - Morone saxatilis - Larvae</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Chronic LC10 781 mg/l Fresh water</td>
<td>Crustaceans - Hyalella azteca - Juvenile (Fledgling, Hatchling, Weanling)</td>
<td>3 weeks</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 6 g/L Fresh water</td>
<td>Aquatic plants - Lemna minor</td>
<td>96 hours</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 0.314 g/L Fresh water</td>
<td>Daphnia - Daphnia pulex</td>
<td>21 days</td>
</tr>
<tr>
<td></td>
<td>Chronic NOEC 100 mg/l Fresh water</td>
<td>Fish - Gambusia holbrooki - Adult</td>
<td>8 weeks</td>
</tr>
</tbody>
</table>

12.2 Persistence and degradability

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Test</th>
<th>Result</th>
<th>Dose</th>
<th>Inoculum</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL1-Blue MRF® E.coli Strain</td>
<td>301D Ready Biodegradability - Closed Bottle Test</td>
<td>93 % - 30 days</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Glycerol</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12.3 Bioaccumulative potential

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>LogPow</th>
<th>BCF</th>
<th>Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL1-Blue MRF® E.coli Strain</td>
<td>-1.76</td>
<td>-</td>
<td>low</td>
</tr>
<tr>
<td>Glycerol</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12.4 Mobility in soil

| Soil/water partition coefficient (Koc) | : Not available. |

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

Section 13. Disposal considerations

13.1 Waste treatment methods

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. 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 13. Disposal considerations

Disposal should be in accordance with applicable regional, national and local laws and regulations. Local regulations may be more stringent than regional or national requirements.

The information presented below only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

Section 14. Transport information

DOT / TDG / Mexico / IMDG / IATA : Not regulated.

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 Annex II of MARPOL and the IBC Code : Not available.

Section 15. Regulatory information

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

U.S. Federal regulations : TSCA 8(a) CDR Exempt/Partial exemption: Not determined
Clean Water Act (CWA) 311: Edetic acid

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed
Clean Air Act Section 602 Class I Substances : Not listed
Clean Air Act Section 602 Class II Substances : Not listed
DEA List I Chemicals (Precursor Chemicals) : Not listed
DEA List II Chemicals (Essential Chemicals) : Not listed
SARA 302/304
Composition/information on ingredients
No products were found.

SARA 304 RQ : Not applicable.
SARA 311/312
Classification : \textit{pDual GC Expression Vector XL1-Blue MRF' E.coli Strain}
EYE IRRITATION - Category 2A

Composition/information on ingredients

Date of issue: 09/25/2018
Section 15. Regulatory information

<table>
<thead>
<tr>
<th>Name</th>
<th>%</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL1-Blue MRF' E.coli Strain</td>
<td>≥10 - ≤25</td>
<td>EYE IRRITATION - Category 2A</td>
</tr>
<tr>
<td>Glycerol</td>
<td>≤3</td>
<td>EYE IRRITATION - Category 2A</td>
</tr>
<tr>
<td>Sodium chloride</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

State regulations

Massachusetts : The following components are listed: GLYCERINE MIST
New York : None of the components are listed.
New Jersey : The following components are listed: GLYCERIN; 1,2,3-PROPANETRIOL
Pennsylvania : The following components are listed: 1,2,3-PROPANETRIOL

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals
Not listed.

Montreal Protocol (Annexes A, B, C, E)
Not listed.

Stockholm Convention on Persistent Organic Pollutants
Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)
Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals
Not listed.

Inventory list

Australia : All components are listed or exempted.
Canada : All components are listed or exempted.
China : All components are listed or exempted.
Europe : All components are listed or exempted.
Japan : Japan inventory (ENCS): All components are listed or exempted.
Japan inventory (ISHL): All components are listed or exempted.
Malaysia : Not determined.
New Zealand : All components are listed or exempted.
Philippines : All components are listed or exempted.
Republic of Korea : All components are listed or exempted.
Taiwan : All components are listed or exempted.
Thailand : Not determined.
Turkey : Not determined.
United States : All components are listed or exempted.
Viet Nam : Not determined.
Section 16. Other information

History

Date of issue : 09/25/2018
Date of previous issue : 03/24/2017
Version : 5

Procedure used to derive the classification

<table>
<thead>
<tr>
<th>Classification</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>XL1-Blue MRF’ E.coli Strain</td>
<td></td>
</tr>
<tr>
<td>EYE IRRITATION - Category 2A</td>
<td>Calculation method</td>
</tr>
</tbody>
</table>

Indicates information that has changed from previously issued version.

Notice to reader

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