SAFETY DATA SHEET
Date Revised: May 13, 2014

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: D-Luciferin
Catalog Number: 99907 / 30028A2
Unit Size: 1 mg / 25mg
Manufacturer/Supplier: Biotium, Inc.
46117 Landing Parkway, Fremont, CA 94538, USA
Phone: 1-510-265-1027, Fax: 1-510-265-1352
Web: http://www.biotium.com

2. HAZARDS IDENTIFICATION

Classification according to Regulation (EC) No 1272/2008[CLP]
None
Classification according to Directive 1999/45/EC
None

Labeling according to Regulation (EC) No 1272/2008[CLP]
Hazard pictogram None
Signal word None
Hazard statements None
Precautionary statements None

HMIS Classification
Health hazard: 0
Flammability: 0
Physical hazards: 0

NFPA Rating
Health hazard: 0
Fire: 0
Reactivity Hazard: 0

3. COMPOSITION//INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS No.</th>
<th>EC No.</th>
<th>Index No.</th>
<th>Weight %</th>
<th>Classification according to 67/548/EEC</th>
<th>Classification according to regulation (EC)No1278/2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>D-Luciferin</td>
<td>2591-17-5</td>
<td>219-981-3</td>
<td>-</td>
<td>80-100%</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

4. FIRST- AID MEASURES

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

**In case of skin contact**
Wash off with soap and plenty of water. Consult a physician.

**In case of eye contact**
Flush eyes with water as a precaution.

**If swallowed**
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

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### 5. FIREFIGHTING MEASURES

**Suitable extinguishing media**
Carbon dioxide, dry chemical extinguishers, foam extinguishers or water.

**Special protective equipment for firefighters**
Wear self contained breathing apparatus for firefighting if necessary.

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### 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions**
Avoid breathing vapors, mist or gas. Remove all sources of ignition.

**Environmental precautions**
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

**Methods and materials for containment and cleaning up**
Contain spillage. Soak up spilled substance with inert absorbent material. Keep in suitable, closed containers for disposal.

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### 7. HANDLING AND STORAGE

**Precautions for safe handling**
Avoid inhalation of vapor or mist.
Avoid direct contact with substance.

**Conditions for safe storage**
Keep container tightly closed in a dry and well-ventilated place.
Store at -20°C.

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### 8. EXPOSURE CONTROLS/PERSOAL PROTECTION

**Components with workplace control parameters**

<table>
<thead>
<tr>
<th>Substance</th>
<th>CAS no.</th>
<th>Control parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>D-Luciferin</td>
<td>2591-17-5</td>
<td>None</td>
</tr>
</tbody>
</table>

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**Personal protective equipment**
Hand protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove’s outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Respiratory protection
Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Eye protection
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Hygiene measures
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>D-Luciferin</th>
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</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Solid</td>
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<tr>
<td>Odor</td>
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</tr>
<tr>
<td>Odor threshold</td>
<td>No information available</td>
</tr>
<tr>
<td>pH</td>
<td>No information available</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>Melting point 201°C</td>
</tr>
<tr>
<td>Boiling point</td>
<td>No information available</td>
</tr>
<tr>
<td>Flash point</td>
<td>No information available</td>
</tr>
<tr>
<td>Evaporate rate</td>
<td>No information available</td>
</tr>
<tr>
<td>Flammability</td>
<td>No information available</td>
</tr>
<tr>
<td>Explosive limits</td>
<td>No information available</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>No information available</td>
</tr>
<tr>
<td>Vapor density</td>
<td>No information available</td>
</tr>
<tr>
<td>Relative density</td>
<td>No information available</td>
</tr>
<tr>
<td>Solubility</td>
<td>Water soluble</td>
</tr>
<tr>
<td>Partition coefficient:n-octanol/water</td>
<td>No information available</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>No information available</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No information available</td>
</tr>
<tr>
<td>Viscosity</td>
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<tr>
<td>Explosive properties</td>
<td>No information available</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>No information available</td>
</tr>
</tbody>
</table>

10. STABILITY AND REACTIVITY

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
No data available

Conditions to avoid
Heat, flames and sparks.

Materials to avoid
No data available

Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - no data available
11. TOXICOLOGICAL INFORMATION

Acute toxicity

Oral LD50  None
Inhalation LC50 None
Dermal LD50  None

Other information on acute toxicity  no data available

Skin corrosion/irritation no data available
Serious eye damage/eye irritation no data available
Respiratory or skin sensitization no data available
Germ cell mutagenicity no data available

Carcinogenicity
IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity no data available

Specific target organ toxicity - single exposure (Globally Harmonized System) no data available
Specific target organ toxicity - repeated exposure (Globally Harmonized System) no data available

Aspiration hazard no data available

Potential health effects
Inhalation May be harmful if inhaled. May cause respiratory tract irritation.
Ingestion May be harmful if swallowed.
Skin May be harmful if absorbed through skin. May cause skin irritation.
Eyes May cause eye irritation.

Additional Information
RTECS: None

12. ECOLOGICAL INFORMATION

Toxicity  no information available
Persistence and degradability  no information available
Biodegradation no information available
Mobility in soil no information available
Results of PBT and vPvB assessment no information available
Other adverse effects no information available
Additional information no information available
13. DISPOSAL CONSIDERATIONS

Do not dispose product directly into sewage. Consult local state or national regulation for proper disposal.

14. TRANSPORT INFORMATION

<table>
<thead>
<tr>
<th>IATA, IMDG, DOT (US)</th>
<th>not dangerous during transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td>UN number</td>
<td>none</td>
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<tr>
<td>UN proper shipping name</td>
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</tr>
<tr>
<td>Transport hazard class</td>
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</tr>
<tr>
<td>Packing group</td>
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<tr>
<td>Environmental hazards</td>
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</tr>
<tr>
<td>Special precaution for user</td>
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</tr>
</tbody>
</table>

15. REGULATION INFORMATION

US Federal Regulations
Us Toxic Substances Control Act (TSCA): Not listed
SARA 302: No chemicals were found.
SARA 313: No chemicals were found.
SARA 311/312 Hazards: No chemicals were found.

16. OTHER INFORMATION

Classification according to Regulation (EC) Nr. 1272/2008

Prepared by: Regulatory Department
Biotium Inc.
Version no. 2
Reason for revision Application of CLP labeling and corresponding requirements

The information provided above is believed to be correct to our best knowledge, but does not purport to be all inclusive, and shall be used only as a guide. This material is sold for research purposes only and is not required to appear on the TSCA inventory. It is not intended for food, drug, household, agricultural or cosmetic use. Its use must be supervised by a technically qualified individual experienced in handling potentially hazardous chemicals. Biotium shall not be held liable for any damage resulting from handling or contact with the above product.
SAFETY DATA SHEET
Date Revised: March 23, 2016

1. PRODUCT AND COMPANY IDENTIFICATION

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Steady-Luc Assay Buffer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catalog Number</td>
<td>30028B-T / 30028B / 30028B2</td>
</tr>
<tr>
<td>Unit Size</td>
<td>4 mL / 12 mL / 100 mL</td>
</tr>
<tr>
<td>Manufacturer/Supplier</td>
<td>Biotium, Inc.</td>
</tr>
<tr>
<td></td>
<td>46117 Landing Parkway, Fremont, CA 94538, USA</td>
</tr>
<tr>
<td></td>
<td>Phone: 1-510-265-1027, Fax: 1-510-265-1352</td>
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<tr>
<td>Web</td>
<td><a href="http://www.biotium.com">http://www.biotium.com</a></td>
</tr>
</tbody>
</table>

2. HAZARDS IDENTIFICATION

Classification according to Regulation (EC) No 1272/2008[CLP] (DTT)
None

Labeling according to Regulation (EC) No 1272/2008[CLP]
Hazard pictogram
None
Signal word
None

Hazard statements
None

Precautionary statements
None

HMIS Classification (Triton X-100)
Health hazard: 2
Flammability: 1
Physical hazards: 0

NFPA Rating (Triton X-100)
Health hazard: 2
Fire: 1
Reactivity Hazard: 0

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS No.</th>
<th>EC No.</th>
<th>Index No.</th>
<th>Weight %</th>
<th>Classification according to regulation (EC)No1278/2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTT</td>
<td>3483-12-3</td>
<td>222-468-7</td>
<td>--</td>
<td>0-20%</td>
<td>--</td>
</tr>
<tr>
<td>Triton X-100</td>
<td>9002-93-1</td>
<td>--</td>
<td>--</td>
<td>5-10%</td>
<td>--</td>
</tr>
</tbody>
</table>
4. FIRST-AID MEASURES

**General advice**
Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

**If inhaled**
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

**In case of skin contact**
Wash off with soap and plenty of water. Consult a physician.

**In case of eye contact**
Flush eyes with water as a precaution.

**If swallowed**
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIREFIGHTING MEASURES

**Suitable extinguishing media**
Carbon dioxide, dry chemical extinguishers, foam extinguishers or water.

**Special protective equipment for firefighters**
Wear self contained breathing apparatus for firefighting if necessary.

6. ACCIDENTAL RELEASE MEASURES

**Personal precautions**
Avoid breathing vapors, mist or gas. Remove all sources of ignition.

**Environmental precautions**
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

**Methods and materials for containment and cleaning up**
Contain spillage. Soak up spilled substance with inert absorbent material. Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

**Precautions for safe handling**
Avoid inhalation of vapor or mist.
Avoid direct contact with substance.

**Conditions for safe storage**
Keep container tightly closed in a dry and well-ventilated place.
Store at -70°C.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Components with workplace control parameters**

<table>
<thead>
<tr>
<th>Substance</th>
<th>Steady-Luc Assay Buffer</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS no.</td>
<td>None</td>
</tr>
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</table>

SDS
PSF008EU
Control parameters None

**Personal protective equipment**

**Hand protection**
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

**Respiratory protection**
Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**Eye protection**
Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

**Hygiene measures**
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

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<thead>
<tr>
<th>Chemical Name</th>
<th>Steady-Luc Assay Buffer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Clear liquid</td>
</tr>
<tr>
<td>Odor</td>
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</tr>
<tr>
<td>Odor threshold</td>
<td>No information available</td>
</tr>
<tr>
<td>pH</td>
<td>No information available</td>
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<tr>
<td>Melting point/freezing point</td>
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<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>No information available</td>
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<tr>
<td>Auto-ignition temperature</td>
<td>No information available</td>
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<tr>
<td>Decomposition temperature</td>
<td>No information available</td>
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<tr>
<td>Viscosity</td>
<td>No information available</td>
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<td>Explosive properties</td>
<td>No information available</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>No information available</td>
</tr>
</tbody>
</table>

### 10. STABILITY AND REACTIVITY

**Chemical stability**
Stable under recommended storage conditions.

**Possibility of hazardous reactions**
No data available

**Conditions to avoid**
Heat, flames and sparks.

**Materials to avoid**
No data available

**Hazardous decomposition products**
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - no data available

11. TOXICOLOGICAL INFORMATION

Acute toxicity

- Oral LD50: Rat - 400 mg/kg (DTT), rat - 1,800 mg/kg (Triton X-100)
- Inhalation LC50: None
- Dermal LD50: Rabbit - 8,000 mg/kg (Triton X-100)

Other information on acute toxicity - no data available

Skin corrosion/irritation - no data available

Serious eye damage/eye irritation
- Eyes – rabbit: Result: Moderate eye irritation - 24 h (Triton X-100)

Respiratory or skin sensitization - no data available

Germ cell mutagenicity - no data available

Carcinogenicity
- IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
- ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.
- NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
- OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity - no data available

Specific target organ toxicity - single exposure (Globally Harmonized System) - no data available

Specific target organ toxicity - repeated exposure (Globally Harmonized System) - no data available

Aspiration hazard - no data available

Potential health effects
- Inhalation: May be harmful if inhaled. May cause respiratory tract irritation.
- Ingestion: May be harmful if swallowed.
- Skin: May be harmful if absorbed through skin. May cause skin irritation.
- Eyes: May cause eye irritation.

Additional Information
- RTECS: EK1610000 (DTT)
- RTECS: MD0907700 (Triton X-100)

12. ECOLOGICAL INFORMATION

Toxicity
- LC50 - Daphnia magna (Water flea) - 27 mg/l - 48 h (DTT)
- Toxicity to fish LC50 - Pimephales promelas (fathead minnow) - 8.9 mg/l - 96.0 h (Triton X-100)
- Toxicity to daphnia and other aquatic invertebrates - EC50 - Daphnia - 26 mg/l - 48 h (Triton X-100)

Persistence and degradability - no information available

Biodegradation
- Biotic/Aerobic Biochemical oxygen demand - Exposure time 28 d Result: 36 Not readily biodegradable. (Closed Bottle test) (Triton X-100)

Mobility in soil - no information available

Results of PBT and vPvB assessment - no information available

RTECS: EK1610000 (DTT)
RTECS: MD0907700 (Triton X-100)
13. DISPOSAL CONSIDERATIONS

Do not dispose product directly into sewage. Consult local state or national regulation for proper disposal.

14. TRANSPORT INFORMATION

**IATA, IMDG, DOT (US)**
- UN number: 3082
- UN proper shipping name: Environmentally hazardous substance, liquid, n.o.s. (p-tertiary-Octylphenoxy polyethyl alcohol)
- Transport hazard class: 9
- Packing group: III
- Environmental hazards: Marine pollutant
- Special precaution for user: none

15. REGULATION INFORMATION

**US Federal Regulations**
- Us Toxic Substances Control Act (TSCA): Triton X-100
- SARA 302: No chemicals were found.
- SARA 313: No chemicals were found.
- SARA 311/312 Hazards: Health hazard, immediate, acute

16. OTHER INFORMATION

Classification according to Regulation (EC) Nr. 1272/2008

Prepared by: Regulatory Department
Biotium Inc.

Version no. 4
Reason for revision: Correction to hazard classification.

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