<table>
<thead>
<tr>
<th>Product code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J8022</td>
<td>Glutamine/Glutamate-Glo™ Assay, 50 mL</td>
</tr>
</tbody>
</table>

Components:

<table>
<thead>
<tr>
<th>Product code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J135</td>
<td>Luciferin Detection Solution</td>
</tr>
<tr>
<td>G885</td>
<td>Reductase Substrate</td>
</tr>
<tr>
<td>G884</td>
<td>Reductase</td>
</tr>
<tr>
<td>J136</td>
<td>NAD, 40mM</td>
</tr>
<tr>
<td>J143</td>
<td>Glutaminase Buffer</td>
</tr>
<tr>
<td>J142</td>
<td>Glutaminase, 100 u/mL</td>
</tr>
<tr>
<td>J141</td>
<td>Glutamate Dehydrogenase, 1000 U/mL</td>
</tr>
<tr>
<td>J139</td>
<td>Glutamate, 10mM</td>
</tr>
</tbody>
</table>
1 Identification

Product identifier
Trade name: Luciferin Detection Solution

Article number: J135

Application of the substance / the mixture Laboratory chemicals

Details of the supplier of the safety data sheet
Manufacturer/Supplier:
Promega Corporation
2800 Woods Hollow Road
Madison, WI 53711
U.S.A.
1-800-356-9526 or (608)-274-4330

Information department: SDS author: Regulatory.Affairs@promega.com

Emergency telephone number:
For Chemical Emergency Spill, Leak, Fire, Exposure, or Accident Call CHEMTREC Day or Night Within USA and Canada: 1-800-424-9300
Outside USA and Canada: +1 703-527-3887 (collect calls accepted)

* 2 Hazard(s) identification

Classification of the substance or mixture

GHS07

Eye Irrit. 2A H319 Causes serious eye irritation.

Label elements
GHS label elements The product is classified and labeled according to the Globally Harmonized System (GHS).
Hazard pictograms GHS07
Signal word Warning
Hazard statements
Causes serious eye irritation.

Precautionary statements
Wash thoroughly after handling.
Wear eye protection / face protection.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.

Classification system:
NFPA ratings (scale 0 - 4)
Health = 1
Fire = 0
Reactivity = 0

(Contd. on page 2)
Trade name: Luciferin Detection Solution

HMIS-ratings (scale 0 - 4)
Health     = 1
Fire       = 0
Reactivity = 0

OSHA Hazard Overview (Criteria according to 29CFR1910.1200): Not applicable
Primary route(s) of entry: Oral
Target Organ(s): Not applicable or unknown

Other hazards
This mixture has not been tested to determine the overall health hazard; therefore in accordance with 29CFR1910.1200, the data reported above pertains to the hazardous ingredients of this mixture.

Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

3 Composition/information on ingredients

Chemical characterization: Mixtures
Description:
The product is a mixture of the hazardous substances listed below along with unlisted nonhazardous substances. The exact concentration percentages of the hazardous substances may be withheld as a Promega Corp. trade secret.

Dangerous components:

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>127087-87-0 Nonylphenol Ethoxylate</td>
<td>&lt;2.00%</td>
</tr>
<tr>
<td>56-81-5 glycerol</td>
<td>&lt;2.00%</td>
</tr>
</tbody>
</table>

Additional information: For the wording of the listed risk phrases refer to section 15.

4 First-aid measures

Description of first aid measures
After inhalation: If the patient feels unwell or is concerned, obtain medical advice.
After skin contact: Generally the product does not irritate the skin.
After eye contact: Rinse opened eye for several minutes under running water.
After swallowing: If the patient feels unwell or is concerned, obtain medical advice.

Information for doctor:
Most important symptoms and effects, both acute and delayed None

Indication of any immediate medical attention and special treatment needed
No further relevant information available.

5 Fire-fighting measures

Extinguishing media
Suitable extinguishing agents:
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

Special hazards arising from the substance or mixture None known

Advice for firefighters No special advice
6 Accidental release measures

Personal precautions, protective equipment and emergency procedures
Remove persons from danger area.
Wear protective clothing.
Environmental precautions: Do not allow to enter sewers/ surface or ground water.
Methods and material for containment and cleaning up:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Reference to other sections
See Section 7 for information on safe handling.
See Section 13 for disposal information.
Protective Action Criteria for Chemicals

<table>
<thead>
<tr>
<th>PAC-1</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>127087-87-0</td>
<td>Nonylphenol Ethoxylate</td>
<td>30 mg/m³</td>
</tr>
<tr>
<td>56-81-5</td>
<td>glycerol</td>
<td>45 mg/m³</td>
</tr>
<tr>
<td>67-56-1</td>
<td>methanol</td>
<td>330 ppm</td>
</tr>
<tr>
<td>7487-88-9</td>
<td>Sulfuric acid magnesium salt (1:1)</td>
<td>20 mg/m³</td>
</tr>
<tr>
<td>25322-68-3</td>
<td>Polyethylene Glycol</td>
<td>30 mg/m³</td>
</tr>
<tr>
<td>1185-53-1</td>
<td>2-Amino-2-(hydroxymethyl)-1,3-propanediolhydrochloride</td>
<td>12 mg/m³</td>
</tr>
<tr>
<td>139-33-3</td>
<td>disodium dihydrogenethylenediaminetetraacetate</td>
<td>11 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PAC-2</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>127087-87-0</td>
<td>Nonylphenol Ethoxylate</td>
<td>330 mg/m³</td>
</tr>
<tr>
<td>56-81-5</td>
<td>glycerol</td>
<td>180 mg/m³</td>
</tr>
<tr>
<td>67-56-1</td>
<td>methanol</td>
<td>2,100 ppm</td>
</tr>
<tr>
<td>7487-88-9</td>
<td>Sulfuric acid magnesium salt (1:1)</td>
<td>220 mg/m³</td>
</tr>
<tr>
<td>25322-68-3</td>
<td>Polyethylene Glycol</td>
<td>1,300 mg/m³</td>
</tr>
<tr>
<td>1185-53-1</td>
<td>2-Amino-2-(hydroxymethyl)-1,3-propanediolhydrochloride</td>
<td>130 mg/m³</td>
</tr>
<tr>
<td>139-33-3</td>
<td>disodium dihydrogenethylenediaminetetraacetate</td>
<td>120 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PAC-3</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>127087-87-0</td>
<td>Nonylphenol Ethoxylate</td>
<td>2,000 mg/m³</td>
</tr>
<tr>
<td>56-81-5</td>
<td>glycerol</td>
<td>1,100 mg/m³</td>
</tr>
<tr>
<td>67-56-1</td>
<td>methanol</td>
<td>7200* ppm</td>
</tr>
<tr>
<td>7487-88-9</td>
<td>Sulfuric acid magnesium salt (1:1)</td>
<td>1,300 mg/m³</td>
</tr>
<tr>
<td>25322-68-3</td>
<td>Polyethylene Glycol</td>
<td>7,700 mg/m³</td>
</tr>
<tr>
<td>1185-53-1</td>
<td>2-Amino-2-(hydroxymethyl)-1,3-propanediolhydrochloride</td>
<td>790 mg/m³</td>
</tr>
<tr>
<td>139-33-3</td>
<td>disodium dihydrogenethylenediaminetetraacetate</td>
<td>730 mg/m³</td>
</tr>
</tbody>
</table>

7 Handling and storage

Handling:
Precautions for safe handling No special precautions are necessary if used correctly.
Information about protection against explosions and fires: The product is not flammable.

Conditions for safe storage, including any incompatibilities

Storage:
Requirements to be met by storerooms and receptacles: No special requirements.
Information about storage in one common storage facility: Not required.
Further information about storage conditions: None.
Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

Components with limit values that require monitoring at the workplace:
The following constituent is the only constituent of the product which has a PEL, TLV or other recommended exposure limit.
At this time, the remaining constituent has no known exposure limits.

**56-81-5 glycerol**

<table>
<thead>
<tr>
<th>PEL</th>
<th>Long-term value: 15* 5** mg/m³</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mist; *total dust **respirable fraction</td>
</tr>
</tbody>
</table>

| TLV | TLV withdrawn-insufficient data human occup. exp. |

Additional information: The lists that were valid during the creation were used as basis.

Exposure controls

Personal protective equipment:

General protective and hygienic measures: Wash hands before breaks and at the end of work.

Breathing equipment: Not required.

Protection of hands:

Protective gloves

Select the glove material considering penetration time, rate of diffusion and degradation time.

It is recommended that the selected protective gloves be tested and approved under NIOSH or EU Directive 89/686/EEC and the standard EN 374 derived from it.

Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

Eye protection: Use equipment for eye protection tested and approved under government NIOSH standards.

9 Physical and chemical properties

Information on basic physical and chemical properties

General Information

Appearance:

<table>
<thead>
<tr>
<th>Form:</th>
<th>Fluid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color:</td>
<td>Colorless</td>
</tr>
<tr>
<td>Odor:</td>
<td>Not determined</td>
</tr>
<tr>
<td>Odor threshold:</td>
<td>Not determined.</td>
</tr>
</tbody>
</table>

Change in condition

| Melting point/Melting range: | Undetermined. |
| Boiling point/Boiling range: | 100 °C (212 °F) |
| Flash point: | Not applicable. |

Flammability (solid, gaseous): Not applicable.

Ignition temperature:

| Decomposition temperature: | Not determined. |

Auto igniting: Product is not selfigniting.
Trade name: Luciferin Detection Solution

### 4.1.5 Danger of explosion:
Product does not present an explosion hazard.

**Explosion limits:**
- **Lower:** Not determined.
- **Upper:** Not determined.

**Vapor pressure:** Not determined.

**Density:** Not determined.
- **Relative density:** Not determined.
- **Vapor density:** Not determined.
- **Evaporation rate:** Not determined.

**Solubility in / Miscibility with Water:** Not miscible or difficult to mix.

**Partition coefficient (n-octanol/water):** Not determined.

**Viscosity:**
- **Dynamic:** Not determined.
- **Kinematic:** Not determined.

**Organic solvents:** 2.1 %

**Water:** 95.1 %

**VOC content:** 0.4 %

**Solids content:** 1.2 %

**Other information:** No further relevant information available.

### 10 Stability and reactivity

**Reactivity:** No further relevant information available.
**Chemical stability**

**Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.

**Possibility of hazardous reactions** No dangerous reactions known.

**Conditions to avoid** No further relevant information available.

**Incompatible materials:** No further relevant information available.

**Hazardous decomposition products** No dangerous decomposition products known.

### 11 Toxicological information

**Information on toxicological effects**

**Acute toxicity:**

**LD/LC50 values that are relevant for classification:** No data available

**Primary irritant effect:**
- **on the skin:** No irritant effect.
- **on the eye:** Irritating effect.

**Sensitization:** No sensitizing effects known.

**Additional toxicological information**

**Carcinogenic categories**

**IARC (International Agency for Research on Cancer)**
None of the ingredients are listed.

**NTP (National Toxicology Program)**
None of the ingredients are listed.
**12 Ecological information**

*Toxicity*

Aquatic toxicity: Not harmful to the aquatic environment
Persistence and degradability: Not available
Behavior in environmental systems:
Bioaccumulative potential: Not known
Mobility in soil: No further relevant information available.

**Ecotoxicity:***

Remark: Not available

*Additional ecological information:*

**General notes:**
Water hazard class 2 (Self-assessment): hazardous for water
Do not allow product to reach ground water, water course or sewage system.
Danger to drinking water if even small quantities leak into the ground.

**Results of PBT and vPvB assessment**

PBT: Not applicable.
vPvB: Not applicable.
Other adverse effects: No further relevant information available.

---

**13 Disposal considerations**

**Waste treatment methods**

**Recommendation:**
Disposal should be in accordance with applicable regional, national and local laws and regulations.
Refer to Section 7: Handling and Storage and Section 8: Exposure Control/Personal Protection for additional handling information and protection of employees.

**Uncleaned packagings:**
**Recommendation:** Disposal must be made according to official regulations.

---

**14 Transport information**

**UN-Number**
Not hazardous for transportation

**DOT, ADR, ADN, IMDG, IATA**
Void

**UN proper shipping name**
None

**DOT, ADR, ADN, IMDG, IATA**
Void

**Transport hazard class(es)**
None

**DOT, ADR, ADN, IMDG, IATA**

**Class**
Void

**Packing group**
None

**DOT, ADR, IMDG, IATA**
Void

**Environmental hazards:**
Not applicable.
Trade name: Luciferin Detection Solution

**15 Regulatory information**

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

*Sara*

**Section 355 (extremely hazardous substances):**
None of the ingredients are listed.

**Section 313 (Specific toxic chemical listings):**
67-56-1 methanol

*TSCA (Toxic Substances Control Act):*
This product contains a substance not listed on the TSCA inventory. This product may be used for R&D use only.
This product may contain a substance not listed on the inventory. This product may be used for R&D use only.

All ingredients are listed.

**Proposition 65**

**Chemicals known to cause cancer:**
None of the ingredients are listed.

**Chemicals known to cause reproductive toxicity for females:**
None of the ingredients are listed.

**Chemicals known to cause reproductive toxicity for males:**
None of the ingredients are listed.

**Chemicals known to cause developmental toxicity:**
67-56-1 methanol

*Cancerogenity categories*

**EPA (Environmental Protection Agency)**
None of the ingredients are listed.

**TLV (Threshold Limit Value established by ACGIH)**
None of the ingredients are listed.

**NIOSH-Ca (National Institute for Occupational Safety and Health)**
None of the ingredients are listed.

**GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).

**Signal word** Warning

**Hazard statements**
Causes serious eye irritation.

**Precautionary statements**
Wash thoroughly after handling.
Wear eye protection / face protection.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.
Continue rinsing.
If eye irritation persists: Get medical advice/attention.
Trade name: Luciferin Detection Solution

National regulations:

Water hazard class: Water hazard class 2 (Self-assessment): hazardous for water.

Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Department issuing SDS:
Promega Corporation
Environmental Health and Safety Department
2800 Woods Hollow Road
Madison, WI
Ph: (608)274-4330
Date of preparation / last revision 04/24/2017 / -

Abbreviations and acronyms:
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
Eye irrit. 2A: Serious eye damage/eye irritation – Category 2A

* Data compared to the previous version altered.
1 Identification

Product identifier
Trade name: Reductase Substrate

Article number: G885
Application of the substance / the mixture Laboratory chemicals

Details of the supplier of the safety data sheet
Manufacturer/Supplier:
Promega Corporation
2800 Woods Hollow Road
Madison, WI 53711
U.S.A.
1-800-356-9526 or (608)-274-4330

Information department: SDS author: Regulatory.Affairs@promega.com
Emergency telephone number:
For Chemical Emergency Spill, Leak, Fire, Exposure, or Accident Call CHEMTREC Day or Night Within USA and Canada: 1-800-424-9300
Outside USA and Canada: +1 703-527-3887 (collect calls accepted)

2 Hazard(s) identification

Classification of the substance or mixture

GHS07

Acute Tox. 4 H312 Harmful in contact with skin.
Flam. Liq. 4 H227 Combustible liquid.

Label elements
GHS label elements The product is classified and labeled according to the Globally Harmonized System (GHS).
Hazard pictograms GHS07
Signal word Warning

Hazard-determining components of labeling:
dimethyl sulfoxide

Hazard statements
Combustible liquid.
Harmful in contact with skin.

Precautionary statements
Wear protective gloves/protective clothing/eye protection/face protection.
Keep away from flames and hot surfaces. – No smoking.
IF ON SKIN: Wash with plenty of water.
Call a POISON CENTER/doctor if you feel unwell.
In case of fire: Use for extinction: CO2, powder or water spray.
Take off contaminated clothing and wash it before reuse.
Store in a well-ventilated place. Keep cool.
Trade name: Reductase Substrate

Dispose of contents/container in accordance with local/regional/national/international regulations.

Classification system:
NFPA ratings (scale 0 - 4)
Health = 2
Fire = 2
Reactivity = 0
HMIS-ratings (scale 0 - 4)
Health = 2
Fire = 2
Reactivity = 0

OSHA Hazard Overview (Criteria according to 29CFR1910.1200):
Toxic
Combustible

Primary route(s) of entry: Oral
Target Organ(s):
Dermal hazard (Cutaneous hazard)
Risk of damage to eyes

Other hazards
This mixture has not been tested to determine the overall health hazard; therefore in accordance with 29CFR1910.1200, the data reported above pertains to the hazardous ingredients of this mixture.

Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

3 Composition/information on ingredients

Chemical characterization: Mixtures
Description:
The product is a mixture of the hazardous substances listed below along with unlisted nonhazardous substances. The exact concentration percentages of the hazardous substances may be withheld as a Promega Corp. trade secret.

Dangerous components:
67-68-5 dimethyl sulfoxide 75-100%

Additional information: For the wording of the listed risk phrases refer to section 15.

4 First-aid measures

Description of first aid measures
General information:
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

After inhalation: If the patient feels unwell or is concerned, obtain medical advice.
After skin contact: Generally the product does not irritate the skin.
After eye contact: Rinse opened eye for several minutes under running water.
After swallowing: Seek immediate medical advice.

Information for doctor:
Most important symptoms and effects, both acute and delayed None
Indication of any immediate medical attention and special treatment needed
No further relevant information available.
Trade name: Reductase Substrate

5 Fire-fighting measures

Extinguishing media
Suitable extinguishing agents: Use fire fighting measures that suit the environment.
Special hazards arising from the substance or mixture: None known
Advice for firefighters: No special advice

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures
Remove persons from danger area.
Wear protective clothing.
Environmental precautions: Dilute with plenty of water.
Methods and material for containment and cleaning up:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to Section 13.
Ensure adequate ventilation.
Reference to other sections
See Section 7 for information on safe handling.
See Section 13 for disposal information.
Protective Action Criteria for Chemicals

<table>
<thead>
<tr>
<th>PAC-1:</th>
<th>67-68-5 dimethyl sulfoxide</th>
<th>150 ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAC-2:</td>
<td>67-68-5 dimethyl sulfoxide</td>
<td>290 ppm</td>
</tr>
<tr>
<td>PAC-3:</td>
<td>67-68-5 dimethyl sulfoxide</td>
<td>1,800 ppm</td>
</tr>
</tbody>
</table>

7 Handling and storage

Handling:
Precautions for safe handling
Keep receptacles tightly sealed.
Ensure good ventilation/exhaustion at the workplace.
Prevent formation of aerosols.
Information about protection against explosions and fires: No special measures required.

Conditions for safe storage, including any incompatibilities
Storage:
Requirements to be met by storerooms and receptacles: No special requirements.
Information about storage in one common storage facility: Not required.
Further information about storage conditions: None.
Specific end use(s) No further relevant information available.
8 Exposure controls/personal protection

Control parameters

Components with limit values that require monitoring at the workplace:

<table>
<thead>
<tr>
<th>Component</th>
<th>Limit Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>67-68-5 dimethyl sulfoxide</td>
<td>Long-term value: 250 ppm</td>
</tr>
</tbody>
</table>

Additional information: The lists that were valid during the creation were used as basis.

Exposure controls

Personal protective equipment:

General protective and hygienic measures:
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Do not eat or drink while working.

Breathing equipment:
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

Protection of hands:

Protective gloves
Select the glove material considering penetration time, rate of diffusion and degradation time.
It is recommended that the selected protective gloves be tested and approved under NIOSH or EU Directive 89/686/EEC and the standard EN 374 derived from it.

Material of gloves
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

Eye protection:

Safety glasses
Use equipment for eye protection tested and approved under government NIOSH standards.

9 Physical and chemical properties

Information on basic physical and chemical properties

General Information

Appearance:
<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>Fluid</td>
</tr>
<tr>
<td>Color</td>
<td>Colorless</td>
</tr>
<tr>
<td>Odor</td>
<td>Not determined</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>Not determined.</td>
</tr>
</tbody>
</table>

Change in condition

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melting point/Melting range</td>
<td>18.45 °C (65 °F)</td>
</tr>
<tr>
<td>Boiling point/Boiling range</td>
<td>Undetermined.</td>
</tr>
<tr>
<td>Flash point</td>
<td>&gt; 60 °C (&gt; 140 °F)</td>
</tr>
</tbody>
</table>

Flammability (solid, gaseous):
Not applicable.

Ignition temperature:
270 °C (518 °F)

Decomposition temperature:
Not determined.

Auto igniting:
Product is not selfigniting.

Danger of explosion:
Product does not present an explosion hazard.


### 4.1.5

**Explosion limits:**
- **Lower:** 1.8 Vol %
- **Upper:** Zeros Vol %

**Vapor pressure at 20 °C (68 °F):** 2.5 hPa (2 mm Hg)

**Density at 20 °C (68 °F):** 1.1 g/cm³ (9.18 lbs/gal)

**Relative density** Not determined.

**Vapor density** Not determined.

**Evaporation rate** Not determined.

**Solubility in / Miscibility with Water:** Fully miscible.

**Partition coefficient (n-octanol/water):** Not determined.

**Viscosity:**
- **Dynamic:** Not determined.
- **Kinematic:** Not determined.

**Organic solvents:** 97.9 %

**Water:** 1.2 %

**VOC content:** 97.9 %

**Other information** No further relevant information available.

---

### 10. Stability and reactivity

**Reactivity** No further relevant information available.

**Chemical stability**

**Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.

**Possibility of hazardous reactions** No dangerous reactions known.

**Conditions to avoid** No further relevant information available.

**Incompatible materials:**
- Oxidizing agents
- Strong acids
- Strong reducing agents

**Hazardous decomposition products:** No dangerous decomposition products known.

---

### 11. Toxicological information

**Information on toxicological effects**

**Acute toxicity:**

**LD/LC50 values that are relevant for classification:**

<table>
<thead>
<tr>
<th>67-68-5 dimethyl sulfoxide</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral LD50</td>
<td>14500 mg/kg (Rat)</td>
</tr>
<tr>
<td>Dermal LD50</td>
<td>1800 mg/kg (Mouse)</td>
</tr>
<tr>
<td>Irritation of eyes acute</td>
<td>500 mg (Rabbit)</td>
</tr>
<tr>
<td></td>
<td>mild irritation</td>
</tr>
</tbody>
</table>

**Primary irritant effect:**

- **on the skin:** No irritant effect.
- **on the eye:** Irritating effect.

**Sensitization:** No sensitizing effects known.

**Additional toxicological information:**

The product shows the following dangers according to internally approved calculation methods for preparations.

(Contd. on page 6)
Trade name: Reductase Substrate

Harmful

Carcinogenic categories

IARC (International Agency for Research on Cancer)
None of the ingredients are listed.

NTP (National Toxicology Program)
None of the ingredients are listed.

OSHA-Ca (Occupational Safety & Health Administration)
None of the ingredients are listed.

* 12 Ecological information

Toxicity
Aquatic toxicity: Not harmful to the aquatic environment
Persistence and degradability Not available
Behavior in environmental systems:
Bioaccumulative potential Not known
Mobility in soil No further relevant information available.
Ecotoxicological effects:
Remark: Not available
Additional ecological information:
General notes: Not known to be hazardous to water.
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.
Other adverse effects No further relevant information available.

* 13 Disposal considerations

Waste treatment methods
Recommendation:
Disposal should be in accordance with applicable regional, national and local laws and regulations.
Refer to Section 7: Handling and Storage and Section 8: Exposure Control/Personal Protection for additional handling information and protection of employees.

Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.
Recommended cleansing agent: Water, if necessary with cleansing agents.

* 14 Transport information

UN-Number Not hazardous for transportation
DOT, ADR, ADN, IMDG, IATA Void

UN proper shipping name None
DOT, ADR, ADN, IMDG, IATA Void

Transport hazard class(es) None
DOT, ADR, ADN, IMDG, IATA Class Void
Trade name: Reductase Substrate

Packing group
DOT, ADR, IMDG, IATA
None

Environmental hazards:
Marine pollutant:
Void

Special precautions for user
Not applicable.

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
Not applicable.

UN "Model Regulation":
Void

15 Regulatory information

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

Section 355 (extremely hazardous substances):
None of the ingredients are listed.

Section 313 (Specific toxic chemical listings):
None of the ingredients are listed.

TSCA (Toxic Substances Control Act):
This product may contain a substance not listed on the inventory. This product may be used for R&D use only.

67-68-5 dimethyl sulfoxide
75277-39-3 4-(2-Hydroxyethyl)piperazine-1-ethanesulfonic acid sodium salt
7732-18-5 water

Proposition 65
Chemicals known to cause cancer:
None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for females:
None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for males:
None of the ingredients are listed.

Chemicals known to cause developmental toxicity:
None of the ingredients are listed.

Cancerogenicity categories
EPA (Environmental Protection Agency)
None of the ingredients are listed.

TLV (Threshold Limit Value established by ACGIH)
None of the ingredients are listed.

NIOSH-Ca (National Institute for Occupational Safety and Health)
None of the ingredients are listed.

GHS label elements The product is classified and labeled according to the Globally Harmonized System (GHS).
Signal word Warning

Hazard-determining components of labeling:
dimethyl sulfoxide
Trade name: Reductase Substrate

### Hazard statements
Combustible liquid.
Harmful in contact with skin.

### Precautionary statements
Wear protective gloves/protective clothing/eye protection/face protection.
Keep away from flames and hot surfaces. – No smoking.
IF ON SKIN: Wash with plenty of water.
Call a POISON CENTER/doctor if you feel unwell.
In case of fire: Use for extinction: CO2, powder or water spray.
Take off contaminated clothing and wash it before reuse.
Store in a well-ventilated place. Keep cool.
Dispose of contents/container in accordance with local/regional/national/international regulations.

**Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

### 16 Other information
This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

**Department issuing SDS:**
Promega Corporation
Environmental Health and Safety Department
2800 Woods Hollow Road
Madison, WI
Ph: (608) 274-4330

**Date of preparation / last revision** 04/24/2017 /

**Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFFA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
REL: Recommended Exposure Limit
Flam. Liq. 4: Flammable liquids – Category 4
Acute Tox. 4: Acute toxicity – Category 4

* Data compared to the previous version altered.
1 Identification

Product identifier
Trade name: Reductase

Article number: G884
Application of the substance / the mixture Laboratory chemicals

Details of the supplier of the safety data sheet
Manufacturer/Supplier:
Promega Corporation
2800 Woods Hollow Road
Madison, WI 53711
U.S.A.
1-800-356-9526 or (608)-274-4330

Information department: SDS author: Regulatory.Affairs@promega.com
Emergency telephone number:
For Chemical Emergency Spill, Leak, Fire, Exposure, or Accident Call CHEMTREC Day or Night Within USA and Canada: 1-800-424-9300
Outside USA and Canada: +1 703-527-3887 (collect calls accepted)

2 Hazard(s) identification

Classification of the substance or mixture
The product is not classified as hazardous according to the Globally Harmonized System (GHS).

Label elements
GHS label elements Void
Hazard pictograms Void
Signal word Void
Hazard statements Void
Classification system:
NFPA ratings (scale 0 - 4)
Health = 0
Fire = 1
Reactivity = 0
HMIS-ratings (scale 0 - 4)
Health = 0
Fire = 1
Reactivity = 0

OSHA Hazard Overview (Criteria according to 29CFR1910.1200): Not applicable
Target Organ(s): Not applicable or unknown
Other hazards
This mixture has not been tested to determine the overall health hazard; therefore in accordance with 29CFR1910.1200, the data reported above pertains to the hazardous ingredients of this mixture.

Results of PBT and vPvB assessment
PBT: Not applicable.
Trade name: Reductase

vPvB: Not applicable.

3 Composition/information on ingredients

Chemical characterization: Mixtures

Description:
The product is a mixture of the hazardous substances listed below along with unlisted nonhazardous substances. The exact concentration percentages of the hazardous substances may be withheld as a Promega Corp. trade secret.

Dangerous components:

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>56-81-5 glycerol</td>
<td>5-10%</td>
</tr>
</tbody>
</table>

Additional information: For the wording of the listed risk phrases refer to section 15.

4 First-aid measures

Description of first aid measures

General information: No special measures required.

After inhalation: If the patient feels unwell or is concerned, obtain medical advice.

After skin contact: Generally the product does not irritate the skin.

After eye contact: Rinse opened eye for several minutes under running water.

After swallowing: If the patient feels unwell or is concerned, obtain medical advice.

Information for doctor:

Most important symptoms and effects, both acute and delayed None

Indication of any immediate medical attention and special treatment needed

No further relevant information available.

5 Fire-fighting measures

Extinguishing media

Suitable extinguishing agents:
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

Special hazards arising from the substance or mixture None known

Advice for firefighters

No special advice

Protective equipment: No special measures required.

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures Not required.

Environmental precautions:

Dilute with plenty of water.

Do not allow to enter sewers/ surface or ground water.

Methods and material for containment and cleaning up:

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

Reference to other sections

See Section 7 for information on safe handling.

See Section 13 for disposal information.
Trade name: Reductase

Protective Action Criteria for Chemicals

PAC-1:

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Chemical Name</th>
<th>PAC Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>56-81-5</td>
<td>glycerol</td>
<td>45 mg/m³</td>
</tr>
<tr>
<td>1185-53-1</td>
<td>2-Amino-2-(hydroxymethyl)-1,3-propanediolhydrochloride</td>
<td>12 mg/m³</td>
</tr>
<tr>
<td>77-86-1</td>
<td>2-Amino-2-(hydroxymethyl)-1,3-propanediol</td>
<td>18 mg/m³</td>
</tr>
</tbody>
</table>

PAC-2:

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Chemical Name</th>
<th>PAC Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>56-81-5</td>
<td>glycerol</td>
<td>180 mg/m³</td>
</tr>
<tr>
<td>1185-53-1</td>
<td>2-Amino-2-(hydroxymethyl)-1,3-propanediolhydrochloride</td>
<td>130 mg/m³</td>
</tr>
<tr>
<td>77-86-1</td>
<td>2-Amino-2-(hydroxymethyl)-1,3-propanediol</td>
<td>190 mg/m³</td>
</tr>
</tbody>
</table>

PAC-3:

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Chemical Name</th>
<th>PAC Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>56-81-5</td>
<td>glycerol</td>
<td>1,100 mg/m³</td>
</tr>
<tr>
<td>1185-53-1</td>
<td>2-Amino-2-(hydroxymethyl)-1,3-propanediolhydrochloride</td>
<td>790 mg/m³</td>
</tr>
<tr>
<td>77-86-1</td>
<td>2-Amino-2-(hydroxymethyl)-1,3-propanediol</td>
<td>1,200 mg/m³</td>
</tr>
</tbody>
</table>

7 Handling and storage

Handling:
Precautions for safe handling: No special measures required.
Information about protection against explosions and fires: No special measures required.

Conditions for safe storage, including any incompatibilities:
Storage:
Requirements to be met by storerooms and receptacles: No special requirements.
Information about storage in one common storage facility: Not required.
Further information about storage conditions: None.
Specific end use(s): No further relevant information available.

8 Exposure controls/personal protection

Control parameters

Components with limit values that require monitoring at the workplace:

<table>
<thead>
<tr>
<th>CAS Number</th>
<th>Chemical Name</th>
<th>Limit Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>56-81-5</td>
<td>glycerol</td>
<td>15* 5** mg/m³</td>
</tr>
</tbody>
</table>

PEL Long-term value: 15* 5** mg/m³
mist; *total dust **respirable fraction
TLV TLV withdrawn-insufficient data human occup. exp.

Additional information: The lists that were valid during the creation were used as basis.

Exposure controls

Personal protective equipment:
General protective and hygienic measures:
The usual precautionary measures for handling chemicals should be followed.
Breathing equipment: Not required.
Protection of hands: Not required.
Material of gloves:
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
9 Physical and chemical properties

Information on basic physical and chemical properties
General Information
Appearance: Fluid
Form: Fluid
Color: Colorless
Odor: Not determined
Odor threshold: Not determined.
P H-value at 20 °C (68 °F): 7.5
Change in condition
Melting point/Melting range: Undetermined.
Boiling point/Boiling range: Undetermined.
Flash point: > 100 °C (> 212 °F)
Flammability (solid, gaseous): Not applicable.
Ignition temperature: 400 °C (752 °F)
Decomposition temperature: Not determined.
Auto igniting: Product is not selfigniting.
Danger of explosion: Product does not present an explosion hazard.
Explosion limits:
Lower: 0.9 Vol %
Upper: 0.0 Vol %
Vapor pressure at 20 °C (68 °F): 0.1 hPa
Density: Not determined.
Relative density: Not determined.
Vapor density: Not determined.
Evaporation rate: Not determined.
Solubility in / Miscibility with
Water: Fully miscible.
Partition coefficient (n-octanol/water): Not determined.
Viscosity:
Dynamic: Not determined.
Kinematic: Not determined.
Organic solvents: 10.0 %
Water: 86.4 %
Other information: No further relevant information available.

10 Stability and reactivity

Reactivity: No further relevant information available.
Chemical stability
Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
Possibility of hazardous reactions: No dangerous reactions known.
Conditions to avoid: No further relevant information available.
Incompatible materials: No further relevant information available.
Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information

Information on toxicological effects
Acute toxicity:
LD/LC50 values that are relevant for classification: No data available
Primary irritant effect:
on the skin: No irritant effect.
on the eye: Irritating effect.
Sensitization: No sensitizing effects known.
Additional toxicological information:
The product is not subject to classification according to internally approved calculation methods for preparations:
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

Carcinogenic categories

IARC (International Agency for Research on Cancer)
None of the ingredients are listed.

NTP (National Toxicology Program)
None of the ingredients are listed.

OSHA-Ca (Occupational Safety & Health Administration)
None of the ingredients are listed.

12 Ecological information

Toxicity
Aquatic toxicity: Not harmful to the aquatic environment
Persistence and degradability: Not available
Behavior in environmental systems:
Bioaccumulative potential: Not known
Mobility in soil: No further relevant information available.
Ecotoxic effects:
Remark: Not available
Additional ecological information:
General notes:
Water hazard class 1 (Self-assessment): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.
Other adverse effects: No further relevant information available.
13 Disposal considerations

Waste treatment methods
Recommendation:
Disposal should be in accordance with applicable regional, national and local laws and regulations.
Refer to Section 7: Handling and Storage and Section 8: Exposure Control/Personal Protection for additional handling information and protection of employees.

Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.
Recommended cleansing agent: Water, if necessary with cleansing agents.

14 Transport information

<table>
<thead>
<tr>
<th>UN-Number</th>
<th>DOT, ADR, ADN, IMDG, IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not hazardous for transportation</td>
<td>Void</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UN proper shipping name</th>
<th>DOT, ADR, ADN, IMDG, IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Void</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Transport hazard class(es)</th>
<th>DOT, ADR, ADN, IMDG, IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Void</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Packing group</th>
<th>DOT, ADR, IMDG, IATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Void</td>
</tr>
</tbody>
</table>

Environmental hazards:
Marine pollutant: No
Special precautions for user: Not applicable.

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable.

UN "Model Regulation": Void

15 Regulatory information

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

Section 355 (extremely hazardous substances):
None of the ingredients are listed.

Section 313 (Specific toxic chemical listings):
None of the ingredients are listed.

TSCA (Toxic Substances Control Act):
This product may contain a substance not listed on the inventory. This product may be used for R&D use only.

- 56-81-5 glycerol
- 1185-53-1 2-Amino-2-(hydroxymethyl)-1,3-propanediolhydrochloride
- 77-86-1 2-Amino-2-(hydroxymethyl)-1,3-propanediol
- 7732-18-5 water
Trade name: Reductase

Proposition 65

Chemicals known to cause cancer:
None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for females:
None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for males:
None of the ingredients are listed.

Chemicals known to cause developmental toxicity:
None of the ingredients are listed.

Cancerogenity categories

EPA (Environmental Protection Agency)
None of the ingredients are listed.

TLV (Threshold Limit Value established by ACGIH)
None of the ingredients are listed.

NIOSH-Ca (National Institute for Occupational Safety and Health)
None of the ingredients are listed.

GHS label elements Void
Signal word Void
Hazard statements Void

National regulations:

Water hazard class: Water hazard class 1 (Self-assessment): slightly hazardous for water.
Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Department issuing SDS:
Promega Corporation
Environmental Health and Safety Department
2800 Woods Hollow Road
Madison, WI
Ph: (608) 274-4330
Date of preparation / last revision 04/24/2017 / -

Abbreviations and acronyms:
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
Trade name: Reductase

OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit

* Data compared to the previous version altered.
1 Identification

Product identifier
Trade name: NAD, 40mM

Article number: J136
Application of the substance / the mixture: Laboratory chemicals

Details of the supplier of the safety data sheet
Manufacturer/Supplier: Promega Corporation
2800 Woods Hollow Road
Madison, WI 53711
U.S.A.
1-800-356-9526 or (608)-274-4330

Information department: SDS author: Regulatory.Affairs@promega.com
Emergency telephone number:
For Chemical Emergency Spill, Leak, Fire, Exposure, or Accident Call CHEMTREC Day or Night Within USA and Canada: 1-800-424-9300
Outside USA and Canada: +1 703-527-3887 (collect calls accepted)

2 Hazard(s) identification

Classification of the substance or mixture
The product is not classified as hazardous according to the Globally Harmonized System (GHS).

Label elements
GHS label elements Void
Hazard pictograms Void
Signal word Void
Hazard statements Void
Classification system:
NFPA ratings (scale 0 - 4)
Health = 0
Fire = 0
Reactivity = 0
HMIS-ratings (scale 0 - 4)
Health = 0
Fire = 0
Reactivity = 0

OSHA Hazard Overview (Criteria according to 29CFR1910.1200): Not applicable
Target Organ(s): Not applicable or unknown

Other hazards
This mixture has not been tested to determine the overall health hazard; therefore in accordance with 29CFR1910.1200, the data reported above pertains to the hazardous ingredients of this mixture.

Results of PBT and vPvB assessment
PBT: Not applicable.

(Contd. on page 2)
Trade name: NAD, 40mM

vPvB: Not applicable.

### 3 Composition/information on ingredients

**Chemical characterization: Substances**

**CAS No. Description**

20111-18-6 B-Nicotinamide Adenine Dinucleotide Sodium

**Chemical characterization: Mixtures**

**Description:**
The product is a mixture of the hazardous substances listed below along with unlisted nonhazardous substances. The exact concentration percentages of the hazardous substances may be withheld as a Promega Corp. trade secret.

**Dangerous components:**

<table>
<thead>
<tr>
<th>CAS No.</th>
<th>Description</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>20111-18-6</td>
<td>B-Nicotinamide Adenine Dinucleotide Sodium</td>
<td>1.0-5.0%</td>
</tr>
</tbody>
</table>

**Additional information:** For the wording of the listed risk phrases refer to section 15.

### 4 First-aid measures

**Description of first aid measures**

**General information:** No special measures required.

**After inhalation:** If the patient feels unwell or is concerned, obtain medical advice.

**After skin contact:** Generally the product does not irritate the skin.

**After eye contact:** Rinse opened eye for several minutes under running water.

**After swallowing:** If the patient feels unwell or is concerned, obtain medical advice.

**Information for doctor:**

Most important symptoms and effects, both acute and delayed None

Indication of any immediate medical attention and special treatment needed

No further relevant information available.

### 5 Fire-fighting measures

**Extinguishing media**

**Suitable extinguishing agents:**

CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

**Special hazards arising from the substance or mixture** None known

**Advice for firefighters**

No special advice

**Protective equipment:** No special measures required.

### 6 Accidental release measures

**Personal precautions, protective equipment and emergency procedures** Not required.

**Environmental precautions:** Do not allow to enter sewers/ surface or ground water.

**Methods and material for containment and cleaning up:** Pick up mechanically.

**Reference to other sections**

See Section 7 for information on safe handling.

See Section 13 for disposal information.
Protective Action Criteria for Chemicals

PAC-1:
None of the ingredients are listed.

PAC-2:
None of the ingredients are listed.

PAC-3:
None of the ingredients are listed.

7 Handling and storage

Handling:
Precautions for safe handling No special measures required.
Information about protection against explosions and fires: The product is not flammable.

Conditions for safe storage, including any incompatibilities
Storage:
Requirements to be met by storerooms and receptacles: No special requirements.
Information about storage in one common storage facility: Not required.
Further information about storage conditions: None.
Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

Control parameters
Components with limit values that require monitoring at the workplace:
The product does not contain any relevant quantities of materials with critical values that have to be monitored at
the workplace.
Additional information: The lists that were valid during the creation were used as basis.

Exposure controls
Personal protective equipment:
General protective and hygienic measures:
The usual precautionary measures for handling chemicals should be followed.
Breathing equipment: Not required.
Protection of hands: Not required.
Material of gloves
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and
varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance
of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
Eye protection: Not required.

9 Physical and chemical properties

Information on basic physical and chemical properties
General Information
Appearance:
Form: Powder
Color: Whitish
Odor: Odorless
**Trade name:** NAD, 40mM

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odor threshold</td>
<td>Not determined.</td>
</tr>
<tr>
<td>pH-value</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Change in condition</td>
<td></td>
</tr>
<tr>
<td>Melting point/Melting range</td>
<td>Undetermined.</td>
</tr>
<tr>
<td>Boiling point/Boiling range</td>
<td>Undetermined.</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Flammability (solid, gaseous)</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Ignition temperature</td>
<td></td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Auto igniting</td>
<td>Product is not selfigniting.</td>
</tr>
<tr>
<td>Danger of explosion</td>
<td>Product does not present an explosion hazard.</td>
</tr>
<tr>
<td>Explosion limits</td>
<td></td>
</tr>
<tr>
<td>Lower</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Upper</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td></td>
</tr>
<tr>
<td>Density</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Relative density</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Vapor density</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Solubility in / Miscibility with</td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>Insoluble.</td>
</tr>
<tr>
<td>Partition coefficient (n-octanol/water)</td>
<td>Not determined.</td>
</tr>
<tr>
<td>Viscosity</td>
<td></td>
</tr>
<tr>
<td>Dynamic</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Kinematic</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Organic solvents</td>
<td>0.0 %</td>
</tr>
<tr>
<td>Water</td>
<td>97.3 %</td>
</tr>
<tr>
<td>Solids content</td>
<td>100.0 %</td>
</tr>
<tr>
<td>Other information</td>
<td>No further relevant information available.</td>
</tr>
</tbody>
</table>

**10 Stability and reactivity**

Reactivity: No further relevant information available.
Chemical stability
Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
Possibility of hazardous reactions: No dangerous reactions known.
Conditions to avoid: No further relevant information available.
Incompatible materials: No further relevant information available.
Hazardous decomposition products: No dangerous decomposition products known.

**11 Toxicological information**

Information on toxicological effects
Acute toxicity:
LD/LC50 values that are relevant for classification: No data available
Primary irritant effect:
on the skin: No irritant effect.
on the eye: Irritating effect.
Sensitization: No sensitizing effects known.
Additional toxicological information:
The product is not subject to classification according to internally approved calculation methods for preparations:
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

Carcinogenic categories

<table>
<thead>
<tr>
<th>Agency</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>IARC (International Agency for Research on Cancer)</td>
<td>None of the ingredients are listed.</td>
</tr>
<tr>
<td>NTP (National Toxicology Program)</td>
<td>None of the ingredients are listed.</td>
</tr>
<tr>
<td>OSHA (Occupational Safety &amp; Health Administration)</td>
<td>None of the ingredients are listed.</td>
</tr>
</tbody>
</table>

12 Ecological information

Toxicity
Aquatic toxicity: Not harmful to the aquatic environment
Persistence and degradability: Not available
Behavior in environmental systems:
Bioaccumulative potential: Not known
Mobility in soil: No further relevant information available.
Ecotoxicological effects:
Remark: Not available
Additional ecological information:
General notes:
Water hazard class 1 (Self-assessment): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.
Other adverse effects: No further relevant information available.

13 Disposal considerations

Waste treatment methods
Recommendation:
Disposal should be in accordance with applicable regional, national and local laws and regulations.
Refer to Section 7: Handling and Storage and Section 8: Exposure Control/Personal Protection for additional handling information and protection of employees.
Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

14 Transport information

<table>
<thead>
<tr>
<th>UN-Number</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not hazardous for transportation</td>
</tr>
</tbody>
</table>
Trade name: NAD, 40mM

**DOT, ADR, ADN, IMDG, IATA**  
 Void

**UN proper shipping name**  
 DOT, ADR, ADN, IMDG, IATA  
 None

**Transport hazard class(es)**  
 DOT, ADR, ADN, IMDG, IATA  
 None

**Packing group**  
 DOT, ADR, IMDG, IATA  
 None

**Environmental hazards:**  
 Marine pollutant:  
 No

**Special precautions for user**  
 Not applicable.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**  
 Not applicable.

**UN "Model Regulation":**  
 Void

---

### 15 Regulatory information

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

**Section 355 (extremely hazardous substances):**  
 None of the ingredients are listed.

**Section 313 (Specific toxic chemical listings):**  
 None of the ingredients are listed.

**TSCA (Toxic Substances Control Act):**  
 This product may contain a substance not listed on the inventory. This product may be used for R&D use only.

**Proposition 65**

**Chemicals known to cause cancer:**  
 None of the ingredients are listed.

**Chemicals known to cause reproductive toxicity for females:**  
 None of the ingredients are listed.

**Chemicals known to cause reproductive toxicity for males:**  
 None of the ingredients are listed.

**Chemicals known to cause developmental toxicity:**  
 None of the ingredients are listed.

**Cancerogenity categories**

**EPA (Environmental Protection Agency)**  
 None of the ingredients are listed.

**TLV (Threshold Limit Value established by ACGIH)**  
 None of the ingredients are listed.

**NIOSH-Ca (National Institute for Occupational Safety and Health)**  
 None of the ingredients are listed.

(Contd. on page 7)
Trade name: NAD, 40mM

GHS label elements Void
Signal word Void
Hazard statements Void

National regulations:
Water hazard class: Water hazard class 1 (Self-assessment): slightly hazardous for water.
Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Department issuing SDS:
Promega Corporation
Environmental Health and Safety Department
2800 Woods Hollow Road
Madison, WI
Ph:(608)274-4330
Date of preparation / last revision 04/24/2017 / -

Abbreviations and acronyms:
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
* Data compared to the previous version altered.
1 Identification

Product identifier
Trade name: Glutaminase Buffer

Article number: J143
Application of the substance / the mixture Laboratory chemicals

Details of the supplier of the safety data sheet
Manufacturer/Supplier:
Promega Corporation
2800 Woods Hollow Road
Madison, WI 53711
U.S.A.
1-800-356-9526 or (608)-274-4330

Information department: SDS author: Regulatory.Affairs@promega.com
Emergency telephone number:
For Chemical Emergency Spill, Leak, Fire, Exposure, or Accident Call CHEMTREC Day or Night Within USA and Canada: 1-800-424-9300
Outside USA and Canada: +1 703-527-3887 (collect calls accepted)

2 Hazard(s) identification

Classification of the substance or mixture
The product is not classified as hazardous according to the Globally Harmonized System (GHS).

Label elements
GHS label elements Void
Hazard pictograms Void
Signal word Void
Hazard statements Void
Classification system:
NFPA ratings (scale 0 - 4)
Health = 0
Fire = 0
Reactivity = 0
HMIS-ratings (scale 0 - 4)
Health = 0
Fire = 0
Reactivity = 0

OSHA Hazard Overview (Criteria according to 29CFR1910.1200): Not applicable
Target Organ(s): Not applicable or unknown

Other hazards
This mixture has not been tested to determine the overall health hazard; therefore in accordance with 29CFR1910.1200, the data reported above pertains to the hazardous ingredients of this mixture.

Results of PBT and vPvB assessment
PBT: Not applicable.

(Contd. on page 2)
**Trade name:** Glutaminase Buffer

**3 Composition/information on ingredients**

**Chemical characterization:** Mixtures

**Description:**
The product is a mixture of the hazardous substances listed below along with unlisted nonhazardous substances. The exact concentration percentages of the hazardous substances may be withheld as a Promega Corp. trade secret.

**Dangerous components:** Void

**Additional information:** For the wording of the listed risk phrases refer to section 15.

**4 First-aid measures**

**Description of first aid measures**

**General information:** No special measures required.

**After inhalation:** If the patient feels unwell or is concerned, obtain medical advice.

**After skin contact:** Generally the product does not irritate the skin.

**After eye contact:** Rinse opened eye for several minutes under running water.

**After swallowing:** If the patient feels unwell or is concerned, obtain medical advice.

**Information for doctor:**

- **Most important symptoms and effects, both acute and delayed:** None
- **Indication of any immediate medical attention and special treatment needed:** No further relevant information available.

**5 Fire-fighting measures**

**Extinguishing media**

- Suitable extinguishing agents: CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

**Special hazards arising from the substance or mixture:** None known

**Advice for firefighters**

- **No special advice**

**Protective equipment:** No special measures required.

**6 Accidental release measures**

**Personal precautions, protective equipment and emergency procedures:** Not required.

**Environmental precautions:** No special measures required.

**Methods and material for containment and cleaning up:**

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

**Reference to other sections**

See Section 7 for information on safe handling.

See Section 13 for disposal information.

**Protective Action Criteria for Chemicals**

<table>
<thead>
<tr>
<th>PAC-1</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>127-09-3</td>
<td>sodium acetate</td>
<td>11 mg/m3</td>
</tr>
<tr>
<td>64-19-7</td>
<td>acetic acid</td>
<td>5 ppm</td>
</tr>
</tbody>
</table>
Trade name: Glutaminase Buffer

### 7 Handling and storage

**Handling:**
- **Precautions for safe handling** No special measures required.
- **Information about protection against explosions and fires:** The product is not flammable.

**Conditions for safe storage, including any incompatibilities**

**Storage:**
- **Requirements to be met by storeroms and receptacles:** No special requirements.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** None.

**Specific end use(s)** No further relevant information available.

### 8 Exposure controls/personal protection

**Control parameters**
- **Components with limit values that require monitoring at the workplace:** The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
- **Additional information:** The lists that were valid during the creation were used as basis.

**Exposure controls**

**Personal protective equipment:**
- **General protective and hygienic measures:** The usual precautionary measures for handling chemicals should be followed.
- **Breathing equipment:** Not required.
- **Protection of hands:** Not required.

**Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

- **Eye protection:** Not required.

### 9 Physical and chemical properties

**Information on basic physical and chemical properties**

**General Information**

**Appearance:**
- **Form:** Fluid
- **Color:** Colorless
- **Odor:** Not determined
- **Odor threshold:** Not determined.
Change in condition
- Melting point/Melting range: Undetermined.
- Boiling point/Boiling range: 100 °C (212 °F)
- Flash point: Not applicable.

Flammability (solid, gaseous): Not applicable.

Ignition temperature:
- Decomposition temperature: Not determined.

Auto igniting: Product is not selfigniting.

Danger of explosion: Product does not present an explosion hazard.

Explosion limits:
- Lower: Not determined.
- Upper: Not determined.
- Vapor pressure: Not determined.

Density: Not determined.
Relative density: Not determined.
Vapor density: Not determined.
Evaporation rate: Not determined.
Solubility in / Miscibility with:
- Water: Not miscible or difficult to mix.
Partition coefficient (n-octanol/water): Not determined.
Viscosity:
- Dynamic: Not determined.
- Kinematic: Not determined.

Organic solvents: 0.2 %
Water: 98.8 %
VOC content: 0.2 %

Other information: No further relevant information available.

10 Stability and reactivity
Reactivity: No further relevant information available.
Chemical stability:
- Thermal decomposition / conditions to be avoided: No decomposition if used according to specifications.
- Possibility of hazardous reactions: No dangerous reactions known.
- Conditions to avoid: No further relevant information available.
- Incompatible materials: No further relevant information available.
- Hazardous decomposition products: No dangerous decomposition products known.

11 Toxicological information
Information on toxicological effects:
- Acute toxicity:
  - LD/LC50 values that are relevant for classification: No data available
- Primary irritant effect:
  - on the skin: No irritant effect.
  - on the eye: Irritating effect.
- Sensitization: No sensitizing effects known.

(Contd. on page 5)
Trade name: Glutaminase Buffer

Additional toxicological information:
The product is not subject to classification according to internally approved calculation methods for preparations:
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

Carcinogenic categories

IARC (International Agency for Research on Cancer)
None of the ingredients are listed.

NTP (National Toxicology Program)
None of the ingredients are listed.

OSHA-Ca (Occupational Safety & Health Administration)
None of the ingredients are listed.

12 Ecological information

Toxicity
Aquatic toxicity: Not harmful to the aquatic environment
Persistence and degradability Not available
Behavior in environmental systems:
Bioaccumulative potential Not known
Mobility in soil No further relevant information available.
Ecotoxicological effects:
Remark: Not available
Additional ecological information:
General notes: Generally not hazardous for water.
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.
Other adverse effects No further relevant information available.

13 Disposal considerations

Waste treatment methods
Recommendation:
Disposal should be in accordance with applicable regional, national and local laws and regulations.
Refer to Section 7: Handling and Storage and Section 8: Exposure Control/Personal Protection for additional handling information and protection of employees.

Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

14 Transport information

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>UN-Number</td>
<td>Not hazardous for transportation</td>
</tr>
<tr>
<td>DOT, ADR, ADN, IMDG, IATA</td>
<td>Void</td>
</tr>
<tr>
<td>UN proper shipping name</td>
<td>None</td>
</tr>
<tr>
<td>DOT, ADR, ADN, IMDG, IATA</td>
<td>Void</td>
</tr>
</tbody>
</table>
### 15 Regulatory information

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

**Sara**

- **Section 355 (extremely hazardous substances):** None of the ingredients are listed.
- **Section 313 (Specific toxic chemical listings):** None of the ingredients are listed.

**TSCA (Toxic Substances Control Act):**

This product may contain a substance not listed on the inventory. This product may be used for R&D use only. All ingredients are listed.

**Proposition 65**

- **Chemicals known to cause cancer:** None of the ingredients are listed.
- **Chemicals known to cause reproductive toxicity for females:** None of the ingredients are listed.
- **Chemicals known to cause reproductive toxicity for males:** None of the ingredients are listed.
- **Chemicals known to cause developmental toxicity:** None of the ingredients are listed.

**Cancerogenity categories**

- **EPA (Environmental Protection Agency)**: None of the ingredients are listed.
- **TLV (Threshold Limit Value established by ACGIH)**: None of the ingredients are listed.
- **NIOSH-Ca (National Institute for Occupational Safety and Health)**: None of the ingredients are listed.

**GHS label elements**

- **Void**
- **Signal word** Void
- **Hazard statements** Void

(Contd. on page 7)
Trade name: Glutaminase Buffer

National regulations:
Water hazard class: Generally not hazardous for water.
Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information
This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Department issuing SDS:
Promega Corporation
Environmental Health and Safety Department
2800 Woods Hollow Road
Madison, WI
Ph: (608)274-4330

Date of preparation / last revision 04/24/2017 / -

Abbreviations and acronyms:
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit

* Data compared to the previous version altered.
1 Identification

Product identifier
Trade name: Glutaminase, 100 u/mL

Article number: J142

Application of the substance / the mixture Laboratory chemicals

Details of the supplier of the safety data sheet
Manufacturer/Supplier:
Promega Corporation
2800 Woods Hollow Road
Madison, WI 53711
U.S.A.
1-800-356-9526 or (608)-274-4330

Information department: SDS author: Regulatory.Affairs@promega.com

Emergency telephone number:
For Chemical Emergency Spill, Leak, Fire, Exposure, or Accident Call CHEMTREC Day or Night Within USA and Canada: 1-800-424-9300
Outside USA and Canada: +1 703-527-3887 (collect calls accepted)

2 Hazard(s) identification

Classification of the substance or mixture
The product is not classified as hazardous according to the Globally Harmonized System (GHS).

Label elements
GHS label elements Void
Hazard pictograms Void
Signal word Void
Hazard statements Void

Classification system:
NFPA ratings (scale 0 - 4)
Health = 0
Fire = 1
Reactivity = 0

HMIS-ratings (scale 0 - 4)
Health = 0
Fire = 1
Reactivity = 0

OSHA Hazard Overview (Criteria according to 29CFR1910.1200): Not applicable

Target Organ(s): Not applicable or unknown

Other hazards
This mixture has not been tested to determine the overall health hazard; therefore in accordance with 29CFR1910.1200, the data reported above pertains to the hazardous ingredients of this mixture.

Results of PBT and vPvB assessment
PBT: Not applicable.

(Contd. on page 2)
Trade name: Glutaminase, 100 u/mL

vPvB: Not applicable.

3 Composition/information on ingredients

Chemical characterization: Mixtures
Description:
The product is a mixture of the hazardous substances listed below along with unlisted nonhazardous substances. The exact concentration percentages of the hazardous substances may be withheld as a Promega Corp. trade secret.

Dangerous components:
56-81-5 glycerol 10-15%

Additional information: For the wording of the listed risk phrases refer to section 15.

4 First-aid measures

Description of first aid measures
General information: No special measures required.
After inhalation: If the patient feels unwell or is concerned, obtain medical advice.
After skin contact: Generally the product does not irritate the skin.
After eye contact: Rinse opened eye for several minutes under running water.
After swallowing: If the patient feels unwell or is concerned, obtain medical advice.
Information for doctor:
Most important symptoms and effects, both acute and delayed: None
Indication of any immediate medical attention and special treatment needed: None
No further relevant information available.

5 Fire-fighting measures

Extinguishing media
Suitable extinguishing agents:
CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
Special hazards arising from the substance or mixture: None known
Advice for firefighters:
No special advice
Protective equipment: No special measures required.

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures: Not required.
Environmental precautions: Do not allow to enter sewers/ surface or ground water.
Methods and material for containment and cleaning up:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Reference to other sections:
See Section 7 for information on safe handling.
See Section 13 for disposal information.
Protective Action Criteria for Chemicals

PAC-1:
56-81-5 glycerol 45 mg/m3
Trade name: Glutaminase, 100 u/mL

<table>
<thead>
<tr>
<th>PAC-2:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>56-81-5 glycerol</td>
<td>180 mg/m³</td>
</tr>
<tr>
<td>1185-53-1 2-Amino-2-(hydroxymethyl)-1,3-propanediolhydrochloride</td>
<td>130 mg/m³</td>
</tr>
<tr>
<td>77-86-1 2-Amino-2-(hydroxymethyl)-1,3-propanediol</td>
<td>190 mg/m³</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PAC-3:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>56-81-5 glycerol</td>
<td>1,100 mg/m³</td>
</tr>
<tr>
<td>1185-53-1 2-Amino-2-(hydroxymethyl)-1,3-propanediolhydrochloride</td>
<td>790 mg/m³</td>
</tr>
<tr>
<td>77-86-1 2-Amino-2-(hydroxymethyl)-1,3-propanediol</td>
<td>1,200 mg/m³</td>
</tr>
</tbody>
</table>

7 Handling and storage

Handling:
Precautions for safe handling: No special measures required.
Information about protection against explosions and fires: No special measures required.

Conditions for safe storage, including any incompatibilities
Storage:
Requirements to be met by storerooms and receptacles: No special requirements.
Information about storage in one common storage facility: Not required.
Further information about storage conditions: None.
Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

Control parameters
Components with limit values that require monitoring at the workplace:

<table>
<thead>
<tr>
<th>56-81-5 glycerol</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PEL</strong></td>
<td></td>
</tr>
<tr>
<td>Long-term value:</td>
<td>15* 5** mg/m³</td>
</tr>
<tr>
<td>mist; *total dust **respirable fraction</td>
<td></td>
</tr>
<tr>
<td><strong>TLV</strong></td>
<td></td>
</tr>
<tr>
<td>TLV withdrawn-insufficient data human occup. exp.</td>
<td></td>
</tr>
</tbody>
</table>

Additional information: The lists that were valid during the creation were used as basis.

Exposure controls
General protective and hygienic measures:
The usual precautionary measures for handling chemicals should be followed.
Breathing equipment: Not required.
Protection of hands: Not required.
Material of gloves:
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
Eye protection: Not required.
## 9 Physical and chemical properties

### Information on basic physical and chemical properties

#### General Information

**Appearance:**
- **Form:** Fluid
- **Color:** Colorless
- **Odor:** Not determined
- **Odor threshold:** Not determined.

#### Change in condition

- **Melting point/Melting range:** Undetermined.
- **Boiling point/Boiling range:** 100 °C (212 °F)
- **Flash point:** > 100 °C (> 212 °F)

#### Flammability (solid, gaseous):
- **Ignition temperature:** 400 °C (752 °F)
- **Decomposition temperature:** Not determined.

#### Auto igniting:
- Product is not selfigniting.

#### Danger of explosion:
- Product does not present an explosion hazard.

**Explosion limits:**
- **Lower:** 0.9 Vol %
- **Upper:** 0.0 Vol %

**Vapor pressure at 20 °C (68 °F):** 0.1 hPa

#### Density:
- Not determined.

#### Relative density
- Not determined.

#### Vapor density
- Not determined.

#### Evaporation rate
- Not determined.

#### Solubility in / Miscibility with
- **Water:** Not miscible or difficult to mix.
- **Partition coefficient (n-octanol/water):** Not determined.

#### Viscosity:
- **Dynamic:** Not determined.
- **Kinematic:** Not determined.

**Organic solvents:** 11.9 %

**Water:** 87.3 %

**Other information**
- No further relevant information available.

## 10 Stability and reactivity

**Reactivity**
- No further relevant information available.

**Chemical stability**

**Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.

**Possibility of hazardous reactions**
- No dangerous reactions known.

**Conditions to avoid**
- No further relevant information available.

**Incompatible materials:**
- No further relevant information available.

**Hazardous decomposition products:**
- No dangerous decomposition products known.
**11 Toxicological information**

**Information on toxicological effects**

**Acute toxicity:**

*LD/LC50 values that are relevant for classification: No data available*

**Primary irritant effect:**

*on the skin: No irritant effect.*

*on the eye: Irritating effect.*

**Sensitization:** No sensitizing effects known.

**Additional toxicological information:**

The product is not subject to classification according to internally approved calculation methods for preparations:

When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

**Carcinogenic categories**

<table>
<thead>
<tr>
<th>IARC (International Agency for Research on Cancer)</th>
</tr>
</thead>
<tbody>
<tr>
<td>None of the ingredients are listed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NTP (National Toxicology Program)</th>
</tr>
</thead>
<tbody>
<tr>
<td>None of the ingredients are listed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OSHA-Ca (Occupational Safety &amp; Health Administration)</th>
</tr>
</thead>
<tbody>
<tr>
<td>None of the ingredients are listed.</td>
</tr>
</tbody>
</table>

**12 Ecological information**

**Toxicity**

*Aquatic toxicity: Not harmful to the aquatic environment*

*Persistence and degradability: Not available*

**Behavior in environmental systems:**

*Bioaccumulative potential: Not known*

*Mobility in soil: No further relevant information available.*

**Ecotoxicological effects:**

*Remark: Not available*

**Additional ecological information:**

**General notes:**

*Water hazard class 1 (Self-assessment): slightly hazardous for water*

*Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.*

**Results of PBT and vPvB assessment**

*PBT: Not applicable.*

*vPvB: Not applicable.*

**Other adverse effects:** No further relevant information available.

**13 Disposal considerations**

**Waste treatment methods**

**Recommendation:**

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: Handling and Storage and Section 8: Exposure Control/Personal Protection for additional handling information and protection of employees.
14 Transport information

| UN-Number | Not hazardous for transportation |
| DOT, ADR, ADN, IMDG, IATA | Void |

| UN proper shipping name | None |
| DOT, ADR, ADN, IMDG, IATA | Void |

| Transport hazard class(es) | None |
| DOT, ADR, ADN, IMDG, IATA | Void |

| Class | Void |

| Packing group | None |
| DOT, ADR, IMDG, IATA | Void |

| Environmental hazards: | Not applicable. |

| Special precautions for user | Not applicable. |

| Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code | Not applicable. |

| UN "Model Regulation": | Void |

15 Regulatory information

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

Sara

Section 355 (extremely hazardous substances):
None of the ingredients are listed.

Section 313 (Specific toxic chemical listings):
None of the ingredients are listed.

TSCA (Toxic Substances Control Act):
This product may contain a substance not listed on the inventory. This product may be used for R&D use only.

All ingredients are listed.

Proposition 65

Chemicals known to cause cancer:
None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for females:
None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for males:
None of the ingredients are listed.

Chemicals known to cause developmental toxicity:
None of the ingredients are listed.
Trade name: Glutaminase, 100 u/mL

Carcinogenicity categories

EPA (Environmental Protection Agency)
None of the ingredients are listed.

TLV (Threshold Limit Value established by ACGIH)
None of the ingredients are listed.

NIOSH-Ca (National Institute for Occupational Safety and Health)
None of the ingredients are listed.

GHS label elements Void
Signal word Void
Hazard statements Void

National regulations:

Water hazard class: Water hazard class 1 (Self-assessment): slightly hazardous for water.
Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Department issuing SDS:
Promega Corporation
Environmental Health and Safety Department
2800 Woods Hollow Road
Madison, WI
Ph:(608)274-4330

Date of preparation / last revision 04/24/2017 / -

Abbreviations and acronyms:
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFFA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLF: Threshold Limit Value
REL: Recommended Exposure Limit

* Data compared to the previous version altered.
1 Identification

Product identifier
Trade name: Glutamate Dehydrogenase, 1000 U/mL

Article number: J141
Application of the substance / the mixture Laboratory chemicals

Details of the supplier of the safety data sheet
Manufacturer/Supplier:
Promega Corporation
2800 Woods Hollow Road
Madison, WI 53711
U.S.A.
1-800-356-9526 or (608)-274-4330

Information department: SDS author: Regulatory.Affairs@promega.com
Emergency telephone number:
For Chemical Emergency Spill, Leak, Fire, Exposure, or Accident Call CHEMTREC Day or Night Within USA and Canada: 1-800-424-9300
Outside USA and Canada: +1 703-527-3887 (collect calls accepted)

2 Hazard(s) identification

Classification of the substance or mixture
The product is not classified as hazardous according to the Globally Harmonized System (GHS).

Label elements
GHS label elements Void
Hazard pictograms Void
Signal word Void
Hazard statements Void
Classification system:
NFPA ratings (scale 0 - 4)
Health = 0
Fire = 1
Reactivity = 0
HMIS-ratings (scale 0 - 4)
Health = 0
Fire = 1
Reactivity = 0

OSHA Hazard Overview (Criteria according to 29CFR1910.1200): Not applicable
Target Organ(s): Not applicable or unknown

Other hazards
This mixture has not been tested to determine the overall health hazard; therefore in accordance with 29CFR1910.1200, the data reported above pertains to the hazardous ingredients of this mixture.

Results of PBT and vPvB assessment
PBT: Not applicable.
3 Composition/information on ingredients

Chemical characterization: Mixtures

Description:
The product is a mixture of the hazardous substances listed below along with unlisted nonhazardous substances. The exact concentration percentages of the hazardous substances may be withheld as a Promega Corp. trade secret.

**Dangerous components:**

| 56-81-5 glycerol | 10-15% |

**Additional information:** For the wording of the listed risk phrases refer to section 15.

4 First-aid measures

**Description of first aid measures**

General information: No special measures required.

After inhalation: If the patient feels unwell or is concerned, obtain medical advice.

After skin contact: Generally the product does not irritate the skin.

After eye contact: Rinse opened eye for several minutes under running water.

After swallowing: If the patient feels unwell or is concerned, obtain medical advice.

Information for doctor:

Most important symptoms and effects, both acute and delayed: None

Indication of any immediate medical attention and special treatment needed: No further relevant information available.

5 Fire-fighting measures

**Extinguishing media**

Suitable extinguishing agents:

CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

Special hazards arising from the substance or mixture: None known

Advice for firefighters

No special advice

No special advice

**Protective equipment:** No special measures required.

6 Accidental release measures

**Personal precautions, protective equipment and emergency procedures:** Not required.

**Environmental precautions:** Do not allow to enter sewers/surface or ground water.

**Methods and material for containment and cleaning up:**

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

**Reference to other sections**

See Section 7 for information on safe handling.

See Section 13 for disposal information.

**Protective Action Criteria for Chemicals**

PAC-1:

| 56-81-5 glycerol | 45 mg/m³ |

(Contd. on page 3)
7 Handling and storage

Handling:
Precautions for safe handling: No special measures required.
Information about protection against explosions and fires: No special measures required.

Conditions for safe storage, including any incompatibilities

Storage:
Requirements to be met by storerooms and receptacles: No special requirements.
Information about storage in one common storage facility: Not required.
Further information about storage conditions: None.
Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

Control parameters

Components with limit values that require monitoring at the workplace:

<table>
<thead>
<tr>
<th>Component</th>
<th>Limit Value</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>56-81-5 glycerol</td>
<td>Long-term value: 15* 5** mg/m³</td>
<td>mist; *total dust **respirable fraction</td>
</tr>
<tr>
<td></td>
<td>TLV</td>
<td>TLV withdrawn-insufficient data human occup. exp.</td>
</tr>
</tbody>
</table>

Additional information: The lists that were valid during the creation were used as basis.

Exposure controls

Personal protective equipment:
General protective and hygienic measures:
The usual precautionary measures for handling chemicals should be followed.

Breathing equipment: Not required.
Protection of hands: Not required.
Material of gloves
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

Eye protection: Not required.
### 9 Physical and chemical properties

#### Information on basic physical and chemical properties

**General Information**

- **Appearance:** Fluid
- **Form:** Fluid
- **Color:** Colorless
- **Odor:** Not determined
- **Odor threshold:** Not determined.

**Change in condition**

- **Melting point/Melting range:** Undetermined.
- **Boiling point/Boiling range:** 100 °C (212 °F)
- **Flash point:** > 100 °C (> 212 °F)

**Flammability (solid, gaseous):** Not applicable.

**Ignition temperature:** 400 °C (752 °F)

**Decomposition temperature:** Not determined.

**Auto igniting:** Product is not selfigniting.

**Danger of explosion:** Product does not present an explosion hazard.

**Explosion limits:**
- **Lower:** 0.9 Vol %
- **Upper:** 0.0 Vol %

**Vapor pressure at 20 °C (68 °F):** 0.1 hPa

**Density at 20 °C (68 °F):** 1.02601 g/cm³ (8.562 lbs/gal)

**Relative density**
Not determined.

**Vapor density**
Not determined.

**Evaporation rate**
Not determined.

**Solubility in / Miscibility with Water:** Not miscible or difficult to mix.

**Partition coefficient (n-octanol/water):** Not determined.

**Viscosity:**
- **Dynamic:** Not determined.
- **Kinematic:** Not determined.

**Organic solvents:** 11.3 %

**Water:** 83.0 %

**Other information**
No further relevant information available.

### 10 Stability and reactivity

**Reactivity** No further relevant information available.

**Chemical stability**

**Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.

**Possibility of hazardous reactions** No dangerous reactions known.

**Conditions to avoid** No further relevant information available.

**Incompatible materials:** No further relevant information available.

**Hazardous decomposition products:** No dangerous decomposition products known.
11 Toxicological information

Information on toxicological effects
Acute toxicity:
LD/LC50 values that are relevant for classification: No data available
Primary irritant effect:
on the skin: No irritant effect.
on the eye: Irritating effect.
Sensitization: No sensitizing effects known.
Additional toxicological information:
The product is not subject to classification according to internally approved calculation methods for preparations:
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

Carcinogenic categories

IARC (International Agency for Research on Cancer)
None of the ingredients are listed.

NTP (National Toxicology Program)
None of the ingredients are listed.

OSHA-Ca (Occupational Safety & Health Administration)
None of the ingredients are listed.

12 Ecological information

Toxicity
Aquatic toxicity: Not harmful to the aquatic environment
Persistence and degradability: Not available
Behavior in environmental systems:
Bioaccumulative potential: Not known
Mobility in soil: Not known
Ecotoxic effects:
Remark: Not available
Additional ecological information:
General notes:
Water hazard class 1 (Self-assessment): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.
Other adverse effects: No further relevant information available.

13 Disposal considerations

Waste treatment methods
Recommendation:
Disposal should be in accordance with applicable regional, national and local laws and regulations.
Refer to Section 7: Handling and Storage and Section 8: Exposure Control/Personal Protection for additional handling information and protection of employees.
Trade name: Glutamate Dehydrogenase, 1000 U/mL

Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

14 Transport information

<table>
<thead>
<tr>
<th>UN-Number</th>
<th>Not hazardous for transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOT, ADR, ADN, IMDG, IATA</td>
<td>Void</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>UN proper shipping name</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOT, ADR, ADN, IMDG, IATA</td>
<td>Void</td>
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</tbody>
</table>

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<tr>
<th>Transport hazard class(es)</th>
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</thead>
<tbody>
<tr>
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<td>Void</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Packing group</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOT, ADR, IMDG, IATA</td>
<td>Void</td>
</tr>
</tbody>
</table>

Environmental hazards: Not applicable.

Special precautions for user: Not applicable.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable.

UN "Model Regulation": Void

15 Regulatory information

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

Sara

Section 355 (extremely hazardous substances):
None of the ingredients are listed.

Section 313 (Specific toxic chemical listings):
None of the ingredients are listed.

TSCA (Toxic Substances Control Act):
This product may contain a substance not listed on the inventory. This product may be used for R&D use only.

All ingredients are listed.

Proposition 65

Chemicals known to cause cancer:
None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for females:
None of the ingredients are listed.

Chemicals known to cause reproductive toxicity for males:
None of the ingredients are listed.

Chemicals known to cause developmental toxicity:
None of the ingredients are listed.

(Contd. on page 7)
Trade name: Glutamate Dehydrogenase, 1000 U/mL

Cancerogenity categories

EPA (Environmental Protection Agency)
None of the ingredients are listed.

TLV (Threshold Limit Value established by ACGIH)
None of the ingredients are listed.

NIOSH-Ca (National Institute for Occupational Safety and Health)
None of the ingredients are listed.

GHS label elements Void
Signal word Void
Hazard statements Void

National regulations:

Water hazard class: Water hazard class 1 (Self-assessment): slightly hazardous for water.
Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Department issuing SDS:
Promega Corporation
Environmental Health and Safety Department
2800 Woods Hollow Road
Madison, WI
Ph: (608)274-4330

Date of preparation / last revision 04/24/2017

Abbreviations and acronyms:
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFFA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLF: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit

* Data compared to the previous version altered.
1 Identification

Product identifier
Trade name: Glutamate, 10mM

Article number: J139
Application of the substance / the mixture Laboratory chemicals

Details of the supplier of the safety data sheet
Manufacturer/Supplier:
Promega Corporation
2800 Woods Hollow Road
Madison, WI 53711
U.S.A.
1-800-356-9526 or (608)-274-4330

Information department: SDS author: Regulatory.Affairs@promega.com
Emergency telephone number:
For Chemical Emergency Spill, Leak, Fire, Exposure, or Accident Call CHEMTREC Day or Night Within USA and Canada: 1-800-424-9300
Outside USA and Canada: +1 703-527-3887 (collect calls accepted)

2 Hazard(s) identification

Classification of the substance or mixture
The product is not classified as hazardous according to the Globally Harmonized System (GHS).

Label elements
GHS label elements Void
Hazard pictograms Void
Signal word Void
Hazard statements Void
Classification system:
NFPA ratings (scale 0 - 4)
Health = 0
Fire = 0
Reactivity = 0
HMIS-ratings (scale 0 - 4)
Health = 0
Fire = 0
Reactivity = 0

OSHA Hazard Overview (Criteria according to 29CFR1910.1200): Not applicable
Target Organ(s): Not applicable or unknown

Other hazards
This mixture has not been tested to determine the overall health hazard; therefore in accordance with 29CFR1910.1200, the data reported above pertains to the hazardous ingredients of this mixture.

Results of PBT and vPvB assessment
PBT: Not applicable.
**3 Composition/information on ingredients**

**Chemical characterization: Substances**
- **CAS No.** Description
  - 142-47-2 L-Glutamic acid, sodium salt (1:1)
- **Identification number(s)**
  - EC number: 205-538-1

**Chemical characterization: Mixtures**
- **Description:** The product is a mixture of the hazardous substances listed below along with unlisted nonhazardous substances. The exact concentration percentages of the hazardous substances may be withheld as a Promega Corp. trade secret.

**Dangerous components:** Void

**Additional information:** For the wording of the listed risk phrases refer to section 15.

---

**4 First-aid measures**

**Description of first aid measures**
- **General information:** No special measures required.
- **After inhalation:** If the patient feels unwell or is concerned, obtain medical advice.
- **After skin contact:** Generally the product does not irritate the skin.
- **After eye contact:** Rinse opened eye for several minutes under running water.
- **After swallowing:** If the patient feels unwell or is concerned, obtain medical advice.

**Information for doctor:**
- Most important symptoms and effects, both acute and delayed: None
- Indication of any immediate medical attention and special treatment needed: None

No further relevant information available.

---

**5 Fire-fighting measures**

**Extinguishing media**
- **Suitable extinguishing agents:** CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

**Special hazards arising from the substance or mixture:** None known

**Advice for firefighters:** No special advice

**Protective equipment:** No special measures required.

---

**6 Accidental release measures**

**Personal precautions, protective equipment and emergency procedures:** Not required.

**Environmental precautions:** Do not allow to enter sewers/surface or ground water.

**Methods and material for containment and cleaning up:**
- Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

**Reference to other sections**
- No dangerous substances are released.
- See Section 7 for information on safe handling.
- See Section 13 for disposal information.
7. Handling and storage

Handling:
Precautions for safe handling: No special measures required.
Information about protection against explosions and fires: The product is not flammable.

Conditions for safe storage, including any incompatibilities
Storage:
Requirements to be met by storerooms and receptacles: No special requirements.
Information about storage in one common storage facility: Not required.
Further information about storage conditions: None.
Specific end use(s) No further relevant information available.

8. Exposure controls/personal protection

Control parameters
Components with limit values that require monitoring at the workplace:
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
Additional information: The lists that were valid during the creation were used as basis.

Exposure controls
Personal protective equipment:
General protective and hygienic measures:
The usual precautionary measures for handling chemicals should be followed.
Breathing equipment: Not required.
Protection of hands: Not required.
Material of gloves
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
Eye protection: Not required.

9. Physical and chemical properties

Information on basic physical and chemical properties
General Information
Appearance:
Form: Fluid
Color: Whitish
Odor: Not determined
**10 Stability and reactivity**

- **Reactivity**: No further relevant information available.
- **Chemical stability**
  - **Thermal decomposition / conditions to be avoided**: No decomposition if used according to specifications.
  - **Possibility of hazardous reactions**: No dangerous reactions known.
- **Conditions to avoid**: No further relevant information available.
- **Incompatible materials**: No further relevant information available.
- **Hazardous decomposition products**: No dangerous decomposition products known.

**11 Toxicological information**

- **Information on toxicological effects**
  - **Acute toxicity**:
    - **LD/LC50 values that are relevant for classification**: No data available
  - **Primary irritant effect**:
    - **on the skin**: No irritant effect.
    - **on the eye**: Irritating effect.
  - **Sensitization**: No sensitizing effects known.
Trade name: Glutamate, 10mM

Additional toxicological information:
The product is not subject to classification according to internally approved calculation methods for preparations:
When used and handled according to specifications, the product does not have any harmful effects according to our experience and the information provided to us.

Carcinogenic categories

<table>
<thead>
<tr>
<th>Agency</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>IARC (International Agency for Research on Cancer)</td>
<td>None of the ingredients are listed.</td>
</tr>
<tr>
<td>NTP (National Toxicology Program)</td>
<td>None of the ingredients are listed.</td>
</tr>
<tr>
<td>OSHA-Ca (Occupational Safety &amp; Health Administration)</td>
<td>None of the ingredients are listed.</td>
</tr>
</tbody>
</table>

12 Ecological information

Toxicity
Aquatic toxicity: Not harmful to the aquatic environment
Persistence and degradability: Not available
Behavior in environmental systems:
Bioaccumulative potential: Not known
Mobility in soil: No further relevant information available.
Ecotoxicological effects:
Remark: Not available

Additional ecological information:
General notes:
Water hazard class 1 (Self-assessment): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.
Other adverse effects: No further relevant information available.

13 Disposal considerations

Waste treatment methods
Recommendation:
Disposal should be in accordance with applicable regional, national and local laws and regulations.
Refer to Section 7: Handling and Storage and Section 8: Exposure Control/Personal Protection for additional handling information and protection of employees.

Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

14 Transport information

<table>
<thead>
<tr>
<th>UN-Number</th>
<th>DOT, ADR, ADN, IMDG, IATA</th>
<th>UN proper shipping name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Not hazardous for transportation</td>
<td>Void</td>
</tr>
<tr>
<td></td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

(Contd. on page 6)
## 15 Regulatory information

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

#### Sara

**Section 355 (extremely hazardous substances):**
None of the ingredients are listed.

**Section 313 (Specific toxic chemical listings):**
None of the ingredients are listed.

**TSCA (Toxic Substances Control Act):**
This product may contain a substance not listed on the inventory. This product may be used for R&D use only.

All ingredients are listed.

#### Proposition 65

**Chemicals known to cause cancer:**
None of the ingredients are listed.

**Chemicals known to cause reproductive toxicity for females:**
None of the ingredients are listed.

**Chemicals known to cause reproductive toxicity for males:**
None of the ingredients are listed.

**Chemicals known to cause developmental toxicity:**
None of the ingredients are listed.

#### Cancerogenity categories

**EPA (Environmental Protection Agency)**
None of the ingredients are listed.

**TLV (Threshold Limit Value established by ACGIH)**
None of the ingredients are listed.

**NIOSH-Ca (National Institute for Occupational Safety and Health)**
None of the ingredients are listed.

**GHS label elements**
Void

**Signal word**
Void
Trade name: Glutamate, 10mM

Hazard statements: Void

National regulations:

Water hazard class: Water hazard class 1 (Self-assessment): slightly hazardous for water.

Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Department issuing SDS:
Promega Corporation
Environmental Health and Safety Department
2800 Woods Hollow Road
Madison, WI
Ph: (608) 274-4330

Date of preparation / last revision: 04/24/2017 / -

Abbreviations and acronyms:
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
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ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
* Data compared to the previous version altered.