Firefly Luciferase

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

SECTION 1: Identification

1.1. Identification

Product form : Mixture
Trade name : Firefly Luciferase
Product code : E0101

1.2. Recommended use and restrictions on use

Recommended use : Use as laboratory reagent
Restrictions on use : For research purpose only

1.3. Supplier

Fermatix
360 Audubon Rd.
Wakefield, MA 01880
T 1-781-557-5577
customerservice@fermatix.com

1.4. Emergency telephone number

Emergency number : For Hazardous Materials or Dangerous Goods Incident Spill, Leak, Fire, Exposure, or Accident Call CHEMTREC Day or Night: 1-800-424-9300 (Toll Free, USA) / 703-527-3887 (Virginia, USA) CCN 1019116

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS US classification

Serious eye damage/eye irritation Category 2B — Causes eye irritation
Specific target organ toxicity (repeated exposure) Category 2 — May cause damage to organs (kidneys) through prolonged or repeated exposure (Oral)

Full text of H statements : see section 16

2.2. GHS Label elements, including precautionary statements

GHS US labeling

Hazard pictograms (GHS US) :

Signal word (GHS US) : Warning
Hazard statements (GHS US) : Causes eye irritation
May cause damage to organs (kidneys) through prolonged or repeated exposure (Oral)
Precautionary statements (GHS US) : Do not breathe mist, spray, vapors.
Wash hands thoroughly after handling.
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.
Get medical advice/attention if you feel unwell.
Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

2.3. Other hazards which do not result in classification

No additional information available.

2.4. Unknown acute toxicity (GHS US)

No additional information available.

SECTION 3: Composition/Information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Name	Product identifier	%	GHS US classification
Ethylene Glycol	CAS-No.: 107-21-1	31.06	Acute Tox. 4 (Oral), H302 Eye Irrit. 2B, H320 STOT RE 2, H373
Glycerine	CAS-No.: 56-81-5	17.63	Not classified
Ammonium sulfate	CAS-No.: 7783-20-2	2.46	Aquatic Acute 3, H402
Enzyme	CAS-No.: 61970-00-1	1.4	Skin Irrit. 2, H315 Eye Irrit. 2A, H319 STOT SE 3, H335

Full text of hazard classes and H-statements : see section 16

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures general : Get medical advice/attention if you feel unwell. First aider: Pay attention to self-protection. Never give anything by mouth to an unconscious person. Give artificial respiration if necessary. Induce artificial respiration with mask fitted with one-way valve or other suitable device but not mouth-to-mouth.

First-aid measures after inhalation : If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. If the victim is unconscious : Lay in a stable manner on victim's side. Induce artificial respiration with mask fitted with one-way valve or other suitable device; not mouth-to-mouth. If experiencing respiratory symptoms: Call a poison center or a doctor.

First-aid measures after skin contact : Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

First-aid measures after eye contact : 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.

First-aid measures after ingestion : Rinse mouth out with water. Do NOT induce vomiting. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Call a poison center/doctor/physician if you feel unwell.

4.2. Most important symptoms and effects (acute and delayed)

Symptoms/effects after inhalation : May cause respiratory irritation.

Symptoms/effects after skin contact : Repeated or prolonged contact may cause slight irritation to the skin.

Symptoms/effects after eye contact : Mild eye irritation.

Symptoms/effects after ingestion : May cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Chronic symptoms : May cause damage to organs (kidneys) through prolonged or repeated exposure (oral).

4.3. Immediate medical attention and special treatment, if necessary

IF exposed or concerned: Get medical advice/attention.

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media : Dry chemical, CO2, or water spray or regular foam.
Unsuitable extinguishing media : Do not use a heavy water stream.

5.2. Specific hazards arising from the chemical

Fire hazard : No fire hazard.
Hazardous decomposition products in case of fire : Toxic fumes may be released. Carbon dioxide. Carbon monoxide.

5.3. Special protective equipment and precautions for fire-fighters

Firefighting instructions : Fight fire from safe distance and protected location. Do not enter fire area without proper protective equipment, including respiratory protection. Move containers from fire area if it can be done without personal risk. Cool affected containers with flooding quantities of water. Prevent fire-fighting water from entering environment.
Protection during firefighting : Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : Avoid all personal contact including breathing in the mist, spray, vapors. Do not take actions involving personal risks. Absorb spillage to prevent material-damage. Stop leak if safe to do so. Notify authorities if product enters sewers or public waters.

6.1.1. For non-emergency personnel

Protective equipment : Wear recommended personal protective equipment.
Emergency procedures : Evacuate the danger area. If outdoors, move to an area upwind of the danger area. Do not breathe mist, spray, vapors. Avoid contact with skin and eyes. Prevent other non-emergency personnel from entering the danger area. If possible without taking personal risks, remove ignition sources, ventilate area.

6.1.2. For emergency responders

Protective equipment : Wear the recommended personal protective equipment. Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".
Emergency procedures : Evacuate personnel to a safe area. Do not touch spilled material. Stop leak if safe to do so.

6.2. Environmental precautions

Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment : Contain with non-combustible inert absorbent. Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams. Stop leak, if possible without risk.
Methods for cleaning up : Take up in non-combustible inert absorbent and place into container for disposal. Contaminated absorbent material may pose the same hazard as the spilt product. Decontaminate surfaces and equipment with . Until a sufficient level of dilution is achieved, the decontamination water may pose the same hazards as the product. Dispose of collected material as soon as possible in accordance with applicable local/regional/national/international regulations.
Other information : Dispose of materials or solid residues at an authorized site.

6.4. Reference to other sections

For further information refer to section 8: "Exposure controls/personal protection". For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed	:	Not expected to present a significant hazard under anticipated conditions of normal use.
Precautions for safe handling	:	Ensure good ventilation of the work station. Use only outdoors or in a well-ventilated area. Do not breathe mist, spray, vapors. Avoid contact with skin, eyes and clothing. Wear personal protective equipment. Take precautionary measures against static discharge.
Hygiene measures	:	Do not eat, drink or smoke when using this product. Always wash hands after handling the product. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions	:	Store in a cool, dry and well-ventilated area away from incompatible substances. Keep container tightly closed.
Incompatible materials	:	Strong acids. Strong oxidizing agents.
Heat-ignition	:	Keep Away From Heat.
Packaging materials	:	Store always product in container of same material as original container.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Firefly Luciferase

No additional information available.

Ammonium sulfate (7783-20-2)

No additional information available.

Glycerine (56-81-5)

USA - OSHA - Occupational Exposure Limits

Local name	Glycerin (mist)
OSHA PEL TWA	15 mg/m³ (Total dust) 5 mg/m³ (Respirable fraction)
Regulatory reference (US-OSHA)	OSHA Annotated Table Z-1

Ethylene Glycol (107-21-1)

USA - ACGIH - Occupational Exposure Limits

Local name	Ethylene glycol
ACGIH OEL TWA	25 ppm (V - Vapor fraction)
ACGIH OEL STEL	10 mg/m³ (I - Inhalable particulate matter, H - Aerosol only)
	50 ppm (V - Vapor fraction)
Remark (ACGIH)	TLV® Basis: URT irr. Notations: A4 (Not classifiable as a Human Carcinogen)
Regulatory reference	ACGIH 2024

Enzyme (61970-00-1)

No additional information available.

8.2. Appropriate engineering controls

Appropriate engineering controls	:	Ensure good ventilation of the work station. Use general ventilation, local exhaust ventilation, or process enclosure to keep the airborne concentrations below the permissible exposure limits. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.
Environmental exposure controls	:	Avoid release to the environment. Take measures to reduce or limit air emissions and releases to soil and the aquatic environment.

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment:
Personal protective equipment should be chosen according to national standards and in discussion with the supplier of the protective equipment. Wear recommended personal protective equipment.

Hand protection:

Wear protective gloves. The following materials are suitable for protective gloves: Butyl rubber, Chloroprene rubber, Fluorocarbon rubber, Nitrile rubber, Polyvinylchloride (PVC)

Eye protection:

Wear safety glasses which protect from splashes

Skin and body protection:

Wear suitable protective clothing

Respiratory protection:

In case of insufficient ventilation, wear suitable respiratory equipment

Personal protective equipment symbol(s):

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	:	Liquid.
Appearance	:	Amorphous.
Color	:	Clear, colorless
Odor	:	No data available
Odor threshold	:	No data available
pH	:	7.8
Melting point	:	Not applicable
Freezing point	:	No data available
Boiling point	:	No data available
Flash point	:	No data available
Relative evaporation rate (butyl acetate=1)	:	No data available
Flammability (solid, gas)	:	Not applicable.
Vapor pressure	:	No data available
Relative vapor density at 20°C	:	No data available
Relative density	:	No data available

Solubility	:	No data available
Partition coefficient n-octanol/water (Log Pow)	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity, kinematic	:	No data available
Viscosity, dynamic	:	No data available
Explosion limits	:	No data available
Explosive properties	:	No data available
Oxidizing properties	:	No data available

9.2. Other information

No additional information available.

SECTION 10: Stability and reactivity

10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

10.2. Chemical stability

Stable under normal conditions of use.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

Heat. Incompatible materials.

10.5. Incompatible materials

Strong acids. Strong oxidizing agents.

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced. Thermal decomposition generates: Carbon dioxide. Carbon monoxide.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	:	Not classified
Acute toxicity (dermal)	:	Not classified
Acute toxicity (inhalation)	:	Not classified

Ammonium sulfate	
LD50 dermal rat	> 2000 mg/kg body weight

Glycerine	
LD50 oral rat	12600 mg/kg
LD50 dermal rabbit	> 10000 mg/kg

Ethylene Glycol	
LD50 oral rat	4700 mg/kg body weight

Ethylene Glycol	
LD50 dermal rat	9530 mg/kg body weight

Skin corrosion/irritation : Not classified
pH: 7.8

Glycerine	
Additional information	Not irritating to rabbits on cutaneous application

Ethylene Glycol	
Skin corrosion/irritation, rabbit	Not irritating to skin

Serious eye damage/irritation : Causes eye irritation.
pH: 7.8

Glycerine	
Additional information	Not irritating to rabbits on ocular application

Ethylene Glycol	
Serious eye damage/irritation, rabbit	<40% Irritating to eyes (Fully reversible effects within 7 days of observation)

Respiratory or skin sensitization : Not classified

Glycerine	
Method, LLNA, mouse	(Not sensitive)

Ethylene Glycol	
Guinea pig maximization test	Not sensitive
Skin sensitization, human	Not sensitive

Germ cell mutagenicity : Not classified

Ethylene Glycol	
Additional information	Dominant lethal test, Rat- Negative

Carcinogenicity : Not classified

Ammonium sulfate	
NOAEL (chronic,oral,animal/male,2 years)	256 mg/kg body weight
NOAEL (chronic,oral,animal/female,2 years)	284 mg/kg body weight

Reproductive toxicity : Not classified
STOT-single exposure : Not classified

Enzyme	
STOT-single exposure	May cause respiratory irritation.

STOT-repeated exposure : May cause damage to organs (kidneys) through prolonged or repeated exposure (Oral).

Ethylene Glycol	
STOT-repeated exposure	May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard : Not classified
Viscosity, kinematic : No data available
Symptoms/effects after inhalation : May cause respiratory irritation.
Symptoms/effects after skin contact : Repeated or prolonged contact may cause slight irritation to the skin.
Symptoms/effects after eye contact : Mild eye irritation.
Symptoms/effects after ingestion : May cause gastrointestinal irritation, nausea, vomiting and diarrhea.
Chronic symptoms : May cause damage to organs (kidneys) through prolonged or repeated exposure (oral).

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : The product is not considered harmful to aquatic organisms or to cause long-term adverse effects in the environment.

Ammonium sulfate	
LC50 - Fish [1]	53 mg/l
EC50 - Crustacea [1]	169 mg/l
EC50 - Other aquatic organisms [1]	121.7 mg/l
LC50 - Fish [2]	57.2 mg/l

Glycerine	
LC50 - Fish [1]	54000 mg/l

Ethylene Glycol	
LC50 - Fish [1]	> 72860 mg/l
EC50 - Crustacea [1]	> 100 mg/l
NOEC (chronic)	≥ 1000 mg/l
NOEC chronic fish	32000 mg/l (7 days)
NOEC chronic crustacea	24000 ml/l (48h)

12.2. Persistence and degradability

No additional information available.

12.3. Bioaccumulative potential

Ethylene Glycol	
Bioaccumulative potential	Does not bioaccumulate.

12.4. Mobility in soil

No additional information available.

12.5. Other adverse effects

No additional information available.

SECTION 13: Disposal considerations

13.1. Disposal methods

Regional waste regulation : Disposal must be done according to official regulations.
Waste treatment methods : Dispose of contents/container in accordance with licensed collector's sorting instructions.
Sewage disposal recommendations : Disposal must be done according to official regulations.
Product/Packaging disposal recommendations : Disposal must be done according to official regulations. Dispose of this material and its container at hazardous or special waste collection point. Refer to all applicable national, international and local regulations or provisions.
Additional information : Do not re-use empty containers.
Ecological waste information : Avoid release to the environment.

SECTION 14: Transport information

In accordance with DOT / IMDG / IATA

DOT	IMDG	IATA
14.1. UN number		
Not regulated for transport		
14.2. Proper Shipping Name		
Not regulated	Not regulated	Not regulated
14.3. Transport hazard class(es)		
Not regulated	Not regulated	Not regulated
14.4. Packing group		
Not regulated	Not regulated	Not regulated
14.5. Environmental hazards		
Not regulated	Not regulated	Not regulated
No supplementary information available		

14.6. Special precautions for user

DOT
Not regulated

IMDG
Not regulated

IATA
Not regulated

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. US Federal regulations

All components of this product are present and listed as Active on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory, except for:		
Enzyme	CAS-No. 61970-00-1	1.4%

Chemical(s) subject to the reporting requirements of Section 313 or Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372.		
Ethylene Glycol	CAS-No. 107-21-1	31.06%

Ethylene Glycol (107-21-1)	
Listed on EPA Hazardous Air Pollutant (HAPS)	
CERCLA RQ	5000 lb

15.2. International regulations

CANADA

Ammonium sulfate (7783-20-2)

Listed on the Canadian DSL (Domestic Substances List)

Glycerine (56-81-5)

Listed on the Canadian DSL (Domestic Substances List)

Ethylene Glycol (107-21-1)

Listed on the Canadian DSL (Domestic Substances List)

Enzyme (61970-00-1)

Not listed on the Canadian DSL (Domestic Substances List)/NDSL (Non-Domestic Substances List)

EU-Regulations

No additional information available.

National regulations

Ammonium sulfate (7783-20-2)

Listed on INSQ (Mexican National Inventory of Chemical Substances)

Glycerine (56-81-5)

Listed on INSQ (Mexican National Inventory of Chemical Substances)

Ethylene Glycol (107-21-1)

Listed on INSQ (Mexican National Inventory of Chemical Substances)

15.3. US State regulations

⚠ **WARNING:** This product can expose you to Ethylene Glycol, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

SECTION 16: Other information

Issue date: 10/22/2024

Full text of hazard classes and H-statements	
H302	Harmful if swallowed
H315	Causes skin irritation
H319	Causes serious eye irritation
H320	Causes eye irritation
H335	May cause respiratory irritation
H373	May cause damage to organs through prolonged or repeated exposure
H402	Harmful to aquatic life

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.