



8210 N. Austin Avenue, Morton Grove, IL 60053-3205, U.S.A.
 847-967-6000 800-323-8144
 (Monday - Friday: 7:30 a.m. - 4:00 p.m. CST)

Emergency Contact:
 INFOTRAC 800-535-5053 [U.S.A.]

Name: D-Luciferin
 Code: 1-360100-100, 1-360201-200, 1-360202-200, 1-360203-200, 1-360204-200, 1-360205-200, 1-360310-200

..... **SAFETY DATA SHEET**

SECTION 1 IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY

- 1.1 Product Identifier
 - Name D-Luciferin
 - Code 1-360100-100, 1-360201-200, 1-360202-200, 1-360203-200, 1-360204-200, 1-360205-200, 1-360310-200
- 1.2 Use of Substance/Mixture
 - Use Analytical—Used in ATP assays
- 1.3 Details of Manufacturer/Supplier
 - Company Regis Technologies, Inc.
 8210 N. Austin Avenue
 Morton Grove, IL 60053
 847-967-6000; 800-323-8144 (toll free)
 Email: cservice@registech.com
 www.registech.com
- 1.4 Emergency Telephone
 - INFOTRAC 800-535-5053 [U.S.A.]

SECTION 2 HAZARDS IDENTIFICATION

- 2.1 Classification of the Substance or Mixture
 - OSHA Hazards No known OSHA hazards.
 - Target Organs None known.

Hazard Indication (67/548/EEC or 1999/45/EC)

 - Symbol(s) NA
 - R-Phrase(s) NA
 - S-Phrase(s) S24/25 Avoid contact with skin and eyes.
 S6 Keep under nitrogen.
 S7/47 Keep container tightly closed and at a temperature not exceeding -10°C.

GHS Classification
 Not a dangerous substance or mixture according to the Globally Harmonized System (GHS).

GHS Label Elements

 - Pictograms or hazard symbols Not applicable
 - Signal Word Not applicable
 - Hazard Statement Not applicable
 - Precautionary Statements Not applicable
 - [Response] P302+P352-IF ON SKIN: Wash with plenty of soap and water.
 P305+P351+P338-IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 - [Storage] P404: Store in a closed container.
 P411+P235+P410: Store at temperatures not exceeding -20 °C/-4°F. Keep cool. Protect from light.

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Name	D-Luciferin
Synonyms	D-(-)-Luciferin; (S)-Luciferin; Firefly Luciferin; (S)-2-(6-Hydroxy-2-benzothiazolyl)-2-thiazoline-4-carboxylic acid; 4,5-Dihydro-2-(6-hydroxy--2Δ-benzothiazolyl)-4-thiazolecarboxylic acid; Luciferin; D-(-)-2-(6'-Hydroxy-2'-benzothiazolyl)-Δ ² -thiazoline-4-carboxylic acid
CAS No.	2591-17-5
EINECS No.	219-981-3

Some abbreviations used throughout this MSDS: NA=not applicable; NE=not established; U=unknown/unavailable; NL=not listed; N=no; Y=yes.



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Chem. Formula	C ₁₁ H ₈ N ₂ O ₃ S ₂	
Mol. Weight	280.33	
Ingredients		Concentration (%/wt)
	D-Luciferin (2591-17-5)	NLT 98.0 %
	Manufacturing impurities	NMT 2.0 %

SECTION 4 FIRST AID MEASURES

- 4.1 Description of first aid measures
 - General: Do not attempt to neutralize as it frequently makes matters worse.
 - Eye contact: Rinse eyes with plenty of water for at least 15 minutes; lift eyelids occasionally. If irritation persists, consult physician.
 - Skin contact: Immediately remove contaminated clothing and shoes, then wash skin with soap and plenty of water. If irritation persists, consult physician.
 - Inhalation: Remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration and keep person warm and at rest. Consult physician.
 - Ingestion: Give large amounts of water or milk (two glasses at most). Avoid vomiting. Consult physician immediately.
 - Physician note: Symptomatic and supportive care. There is no specific antidote.
- 4.2 Most important symptoms and effects, both acute and delayed.
 - Eyes-may cause mild irritation on contact. May be irritating to skin. May be irritating to mucous membranes, if mists are inhaled. May be harmful if ingested.
- 4.3 Indication of immediate medical attention and special treatment needed.
 - No information available.

SECTION 5 FIRE-FIGHTING MEASURES

- 5.1 Suitable Extinguishing Media
 - Not applicable.
- 5.2 Specific hazards arising from the chemical.
 - Non flammable or combustible.
 - Explosion potential--none.
 - Avoid inhalation of material or combustion by-products.
 - Emits toxic fumes under fire conditions: May emit carbon oxides, sulfur oxides, nitrogen oxides.
- 5.3 Advice for fire-fighters
 - Wear protective clothing to prevent contact with skin and eyes.

SECTION 6 ACCIDENTAL RELEASE MEASURES

- 6.1 Personal precautions, protective equipment, and emergency procedures
 - For non-emergency personnel - Avoid material contact or inhalation of mists. Evacuate unnecessary personnel from area.
 - For emergency responders – Wear protective clothing to prevent contact with skin and eyes. Avoid breathing mists. See Section 8.3.
- 6.2 Environmental precautions
 - Prevent material from entering drains.
- 6.3 Methods of clean up
 - Ventilate area. Isolate spilled material. Absorb using chemically compatible spill pillows, or similar adsorbent material. Sweep up, if not absorbed in pillow, seal in appropriate hazardous waste container, and hold for proper waste disposal. Keep out of water supplies and sewers. Wash spill site after material pickup is complete.

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SECTION 7 HANDLING AND STORAGE.....

- 7.1 Safe Handling Precautions
 Wear suitable protective equipment to avoid contact with skin, eyes, or inhalation of mists.
 May be irritating to skin or eyes. May be irritating to mucous membranes, if mists are inhaled. May be harmful if ingested.
 Wash after handling.
- 7.2 Storage Conditions
 Store tightly closed in a cool, dry, and well ventilated place. Store away from incompatible materials (See Section 10.).

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION.....

- 8.1 Control parameters
 Exposure limits: D-Luciferin –
 OSHA – PEL No limits established.
 ACGIH – TLV No limits established.

 Environmental Do not empty into drains.
- 8.2 Appropriate engineering controls
 Safety shower and eye wash
 Local exhaust and mechanical ventilation required. Hood recommended. Fume scrubber.
- 8.3 Personal protection
 Eye/Face Chemical safety eyewear or goggles.
 Hand Compatible chemical-resistant gloves.
 Respiratory If exposure to mists likely: NIOSH/MSHA approved respirator for organic vapor and mists.
 Dermal (not hand) Protective Clothing (e.g., lab coat)
 Hygiene Avoid inhalation, ingestion; contact with eyes, skin, and clothing; Avoid prolonged or repeated exposure.
 Wash thoroughly after handling.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on physical and chemical data

Chemical Formula	C ₁₁ H ₈ N ₂ O ₃ S ₂	
Molecular Weight	280.33	
Form	powder	
Appearance	light yellow	
Odor	none	
Odor threshold	No data available.	
pH	Neutral	
Melting/freezing point	197-203°C NLT ± 3°C range (386-399°F)	
Boiling point:	>300°C (>571°F)	
Flammability (liquid)		
Flash Point	No data available.	
Flammable limits (%v/v)	UEL (upper explosive limit)	No data available.
	LEL (lower explosive limit)	No data available.
Autoignition temperature	No data available.	
Decomposition temperature	No data available.	
OSHA Flammability Class	No data available.	
Evaporation Rate (BuAc = 1.0)	No data available.	
Vapor pressure (mmHg)	<1 @ 20°C	
Vapor density (air=1):	> 1 (air = 1)	
Relative density (g/cm ³)	1.555	

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Water Solubility	Slight; soluble in alkaline aqueous soln.
Water reactive	No data available.
Solubility (other)	No data available.
Partition coefficient: N-octanol/water	Kow (Pow) = No data available.
Viscosity	No data available.
UV Absorbance:	$\epsilon_{330 \pm 2 \text{ nm}} = 17,800 \text{ to } 19,200$ and $\epsilon_{268 \pm 2 \text{ nm}} = 7,100 \text{ to } 7,700$
Biological Activity:	Neutral pH: A_{327}/A_{268} NLT 2.3 and Basic pH: A_{385}/A_{285} NLT 2.5
Optical Rotation:	$[\alpha]_D^{20} = -36 \pm 3^\circ\text{C}$ (c = 1.2 in DMF)

SECTION 10 **STABILITY AND REACTIVITY**

- 10.1 Reactivity
No dangerous reaction known under conditions of normal use.
- 10.2 Chemical Stability
Stable if stored dry, under nitrogen in light-tight containers, in the dark at or below -20°C.
- 10.3 Possibility of hazardous reactions
No hazardous reactions known under conditions of normal use.
- 10.4 Conditions to avoid
Avoid incompatibilities.
Keep out of water supplies and sewers.
- 10.5 Incompatible materials
Light (photosensitive), heat, air sensitive—Discolors or decomposes upon exposure to light, heat, and/or air.
Oxidizers
- 10.6 Hazardous decomposition products
Combustion carbon oxides, sulfur oxides, nitrogen oxides

SECTION 11 **TOXICOLOGICAL INFORMATION**

11.1 Toxicological Information		
Acute toxicity	Oral LD50	No data available.
	Inhalation LC50	No data available.
	Dermal LD50	No data available.
	Other acute toxicity	No data available.
Skin corrosion/irritation	No data available.	
Serious eye damage/irritation	No data available.	
Respiratory irritation	No data available.	
Respiratory or skin sensitization	No data available.	
Germ cell mutagenicity	No data available.	
Carcinogenicity		
IARC	No data available.	
NTP	No data available.	
OSHA	No data available.	
Reproductive toxicity (Including teratogenicity)	No data available.	
Specific target organ toxicity (STOT)		
STOT-single exposure	No data available.	
STOT-repeated exposure	No data available.	
Aspiration hazard	No data available.	
RTECS Number	Not available	

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11.2 Further Information

Potential health effects

Eye	May be irritating.
Skin	May be irritating.
Inhalation	May be irritating to mucous membranes and respiratory tract. May be harmful.
Ingestion	May be harmful.
Symptoms	See above route. Pre-existing conditions that may be aggravated: not determined.
Miscellaneous	No data available.

SECTION 12 **ECOLOGICAL INFORMATION**

12.1 Ecotoxicity	No data available.
12.2 Persistence and degradability	No data available.
12.3 Bioaccumulative potential	BCF = No data available.
12.4 Motility in soil	Log Kow = No data available.
12.5 Other adverse effects	No data available..

SECTION 13 **DISPOSAL CONSIDERATIONS**

13.1 Disposal methods

U . S. EPA Waste Codes	None
Waste Characterization (per U. S. regulations)	RCRA Hazard Class (40CFR 261): none Generator is responsible for proper waste characterization. NOTE: U. S. state hazardous waste regulations may differ considerably from U. S. Federal regulations.
Waste Disposal	That which cannot be recovered or recycled, should be disposed of in accordance with all applicable international, national, regional, state, and local laws. Do NOT dump into any sewer, on ground, or into any body of water.

SECTION 14 **TRANSPORT INFORMATION**

14.1 UN number	Not applicable. Not regulated—Not a dangerous goods.
14.2 UN proper shipping name	Not applicable.
14.3 Transport Hazard Class	Not applicable.
14.5 Packing group	Not applicable.
14.6 Environmental hazards	Not applicable
14.6 Special precautions for user	See Section 8 for exposure/personal protection guidance. NA Emergency Guidebook Number: Not applicable.

SECTION 15 **REGULATORY INFORMATION**

15.1 Safety, health and Environmental regulations specific for the product in question.

OSHA Health: No known hazards.	Physical: No known hazards.
NFPA: H0 F0 R0	HMIS: H0 F0 PH0

15.2 Chemical Inventory Lists

.....	D-Luciferin
CAS Number.....	2591-17-5
TSCA:	NL
EINECS:.....	NL
Number	NA
OSHA Process Safety [29 CFR 1910.119]:	NL
TQ (lbs).....	NA

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CERCLA [Section 103 (40 CFR 302.4)]:..... NL
 RQ (lbs) NA
 RCRA Waste Code..... NA
 Clean Air Act
 [Section 112r (40 CFR 68)]:..... NL
 TQ (lbs)..... NA
 Contains Ozone Depleters (Class I or Class II) N
 [Section 103 (40 CFR 302.4)]: NL
 SARA Title III Notification [40 CFR 302.4]:
 Section 302/304 (EHS) Ingredient [40 CFR 355.3]..... NL
 TPQ (lbs)..... NA
 RQ (lbs) NA
 Section 313 Ingredient [40 CFR 372.65] NL
 SARA Hazards Acute..... N Chronic..... N Fire.....N Pressure..... N ReactivityN
 State Lists: NL
 States..... NL
 On CA 65 Significant Risk Level..... NL

SECTION 16 **OTHER INFORMATION**

16.1 Literature References

None.

The above information is believed to be correct to the best of our present state knowledge, but does not purport to be all-inclusive and shall be used only as a guide. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of any properties of the product.

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