



8210 N. Austin Avenue, Morton Grove, IL 60053-0519, 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 (free acid)  
 Code: 1-360100-100, 1-360201-200, 1-360202-200, 1-360204-200, 1-360310-200

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

**SECTION 1 ..... PRODUCT IDENTIFICATION .....**

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

**SECTION 2 ..... COMPOSITION, INFORMATION ON INGREDIENTS .....**

*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<sup>2</sup>-thiazoline-4-carboxylic acid

CAS #: 2591-17-5

MF: C<sub>11</sub>H<sub>8</sub>N<sub>2</sub>O<sub>3</sub>S<sub>2</sub>

*Ingredients*

*Concentration (%)*

D-Luciferin (2591-17-5) .....	NLT	98.0%
Manufacturing Impurities .....	NMT	2.0%

**SECTION 3 ..... HAZARDS IDENTIFICATION.....**

*Precautionary Statements*

See Sections 8 and 11 for further details.

*The properties of this material have not been fully investigated. Use due caution in handling and use of this material.*

**..... Emergency Overview .....**

NFPA Ratings (Scale 0-4); Health = 1; Fire = 1; Reactivity = 1;

Solid: light yellow powder

Treat as a combustible solid. Keep away from ignition sources, excess heat, and oxidizing agents.

Light (photosensitive), heat, and oxygen sensitive—readily discolors or decomposes upon exposure.

May irritation to skin, eyes, mucous membranes, and upper respiratory system. May be harmful if inhaled, swallowed, or absorbed through skin.

*The properties of this material have not been fully investigated. Use due caution in handling and use of this material.*

*Emits toxic fumes under fire conditions*--potential chemical or thermal decomposition products: carbon oxides, sulfur oxides, nitrogen oxides

*Standard chemical handling precautions:* Avoid breathing dusts. Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling.

*Target organs (possible):* skin, eyes, mucous membranes, and respiratory tract

See Sections 4, 5, 6, 8, 9, and 10.

*Other Hazard Information*

Primary Route(s) of Entry: Skin or eye contact, inhalation, ingestion

Eye: May cause irritation.

Skin: May cause skin irritation. May be harmful if absorbed through skin.

Inhalation: May cause irritation or burns to mucous membranes and upper respiratory tract. May be harmful if inhaled.

Ingestion: May be harmful if ingested.

Acute See above route.

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**SECTION 7 ..... HANDLING AND STORAGE.....**

*General Handling and Storage Measures*

See Section 8 Below.

*Special Storage Instructions*

Photosensitive (light) substance. This material is sensitive to heat and oxygen.

Store at or below -10°C in the absence of light and oxygen. Re-blanket carefully with nitrogen or argon after opening.

Store away from oxidizing materials.

*Special Handling Instructions*

Photosensitive substance. Minimize contact with light and heat.

Handle and store under nitrogen.

**SECTION 8 ..... EXPOSURE CONTROLS, PERSONAL PROTECTION .....**

*Airborne Exposure Limits*

		TWA (8H)		STEL		Ceiling Limit		Ceiling (skin)	
		ppm	mg/m <sup>3</sup>	ppm	mg/m <sup>3</sup>	ppm	mg/m <sup>3</sup>	ppm	mg/m <sup>3</sup>
D-Luciferin	OSHA PEL/VPEL	NE	NE	NE	NE	NE	NE	NE	NE
2591-17-5	ACGIH - TLV	NE	NE	NE	NE	NE	NE	NE	NE

NE = Not established

*Special/Other Control Measures*

Odor threshold: NE

*Personal Protective Equipment (PPE)*

Chemical safety eyewear

Compatible chemical-resistant gloves

NIOSH/MSHA approved respirator with organic vapor, mist and dust cartridges to prevent inhalation.

Protective Clothing (e.g., lab coat)

*Other Safety Equipment and Engineering Preventive Measures*

Safety shower and eye wash

Mechanical exhaust

*General Precautions and Handling Measures*

Avoid ingestion, inhalation and contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

Wash thoroughly after handling. Discard contaminated footwear.

**SECTION 9 ..... PHYSICAL AND CHEMICAL PROPERTIES.....**

*Chemical Family:* Benzothiazole carboxylic acid

*Use:* Analytical: used in ATP assays

*Appearance, Odor, and Other Properties*

light yellow powder

*Odor:* none

*MP:* 197-203°C NLT ± 3°C range (386-399°F)

*FW:* 280.33

*bp:* >300°C (>571°F)

*Solubility in Water:* slight; soluble in alkaline aqueous soln.

*pH:* Neutral

*UV Absorbance:* ε<sub>330 + 2 nm</sub> = 17,800 to 19,200

*Percent purity:* NLT 98%

ε<sub>268 + 2 nm</sub> = 7,100 to 7,700

*VP (mmHg):* <1 @ 20°C

*Biological Activity:* Neutral pH: A<sub>327</sub>/A<sub>268</sub> NLT 2.3

*Vapor Density:* > 1 (air = 1)

Basic pH: A<sub>385</sub>/A<sub>285</sub> NLT 2.5

*% Volatiles:* NA

*Optical Rotation:* [α]<sub>D</sub><sup>20</sup> = -36 ± 3°C (c = 1.2 in DMF)

*Evap. Rate:* NA

*Specific Gravity (H<sub>2</sub>O = 1.0):* 1.555

*Viscosity:* NA

*Refractive Index:* NA

*Solubility in Organic Solvents:* methanol, acetone, ethyl acetate, DMF

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**SECTION 10 ..... STABILITY AND REACTIVITY .....**

*Stability*

Stable if stored dry under nitrogen in light-tight containers, in the dark at or below -10°C

*Incompatibilities*

Oxidizers

Light (photosensitive), heat, air sensitive—Discolors or decomposes upon exposure to light, heat, and/or air

*Precautions*

Avoid incompatibilities.

*Hazardous Combustion or Decomposition Products*

May emit carbon oxides, sulfur oxides, nitrogen oxides

*Hazardous Polymerization*

None

**SECTION 11 ..... TOXICOLOGICAL INFORMATION .....**

*To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.*

*RTECS #*

*CAS #*

not assigned	D-Luciferin	2591-17-5
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*Only selected Registry of Toxic Effects of Chemical Substances data (RTECS) is presented here. See actual entry in RTECS for complete information.*

*Irritation Data*

	eye	skin
D-Luciferin	NDA	NDA

*Toxicity Data*

	oral	inhalation	dermal or other
D-Luciferin	NDA	NDA	NDA

*Carcinogenicity*

	OSHA	IARC	NTP	ACGIH	NIOSH	Notes
D-Luciferin	NL	NL	NL	NL	NL	None

*NL = Not Listed as a carcinogen;*

*Teratogenicity and Reproductive Effects*

No data available.

*Neurotoxicity*

No data available.

*Mutagenicity*

No data available.

*Miscellaneous*

D-Luciferin is used as a substrate for the luciferase enzyme for analytical monitoring of low levels of ATP.

*Symptoms, Acute and Chronic Effects*

See specific route responses in Section 3 **Hazards Identification** above.

**SECTION 12 ..... ECOLOGICAL INFORMATION .....**

*Ecotoxicity or Environmental Toxicity and Fate:* D-Luciferin: no data available.

*Standard Chemical Precautions:* Keep out of air, water, and soil

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**SECTION 13 ..... DISPOSAL CONSIDERATIONS .....**

*That which cannot be recovered or recycled, should be disposed of in accordance with all applicable Federal, State, and local environmental regulations.*

RCRA waste code(s): None RCRA Hazard Class (40CFR 261): None

**SECTION 14 ..... TRANSPORT INFORMATION.....**

*Ship in accordance with all applicable local, State, Federal, and International transportation regulations. The following is a summary only. Check regulations for complete information:*

U. S. Department of Transportation (49CFR171.101)  
 Shipping Name: Not Listed  
 ID Number: NA  
 Hazard Class or Division: NA  
 Packing Group: NA

**SECTION 15 ..... REGULATORY INFORMATION .....**

*Reviews, Standards, and Regulations*

..... D-Luciferin  
 .....2591-17-5  
 TSCA:.....N\*  
 \*This chemical is for research and development use only.  
 EINECS:.....Y  
 Number.....219-981-3  
 State Lists:.....NL  
 States.....NL on CA, FL, MA  
 .....NL on MN, NJ, PA  
 CA No Significant Risk Level.....NL  
 OSHA Process Safety [29 CFR 1910.119]:.....NL  
 Clean Air Act  
 [Section 112r (40 CFR 68)]:.....NL  
 TQ (lbs).....NA  
 Contains Ozone Depleters (Class I or Class II).....NL  
 Clean Air Act [Section 103 (40 CFR 302.4)]:.....NL  
 CERCLA [Section 103 (40 CFR 302.4)]:.....NL  
 RQ (lbs).....NA  
 RCRA Waste Code.....NA  
 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

*Hazard Classes*

Sara Title III	Acute	Chronic	Fire	Pressure	Reactivity
	Y	N	N	N	N

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*Hazard Classes*

	Health	Flammability	Reactivity	Special Hazards
NFPA	1	1	1	None
HMIS	1	1	1	None

*Risk Phrases:*

**Caution: The properties of this material have not been fully investigated.**

*Safety Phrases:*

- S6 ..... Keep under nitrogen or argon.
- S7/47 ..... Keep container tightly closed at or below -10°C in the dark.
- S24/25 ..... Avoid contact with skin and eyes.
- S32 ..... Do not breathe dust.

**SECTION 16 ..... OTHER INFORMATION .....**

*Miscellaneous*

The health and toxicological hazards of this compound have not been fully investigated; therefore, this substance must be handled only by, or under close supervision of those qualified in the handling and use of potentially hazardous substances.

*This MSDS was revised as follows:*

Section

- Header/footer Corrected free base to free acid, updated version, date, and added additional catalog numbers.
- 1 Added additional catalog numbers.
- 11 Corrected a minor spelling error.
- 15 Corrected the NFPA/HMIS codes.

*Disclaimer*

The above information is believed to be correct, but does not purport to be all-inclusive and shall be used only as a guide. Regis Technologies, Inc., does not guarantee said information is accurate or complete, *nor shall any of this information constitute a warranty, whether expressed or implied, as to the safety of the goods, the merchantability of the goods, or the fitness of the goods for a particular purpose.* Adjustment to conform with the actual conditions of usage may be required. Regis Technologies, Inc. shall not be held liable for any damage resulting from handling or from contact with the above product, nor for the results obtained, or for incidental or consequential damage arising from the use of these data. No freedom from infringement of any patent, copyright or trademark is to be inferred.

Approved of by: MBF

***This is the last page of this MSDS.***