

Product Datasheet

D-Luciferin Potassium

Catalog No. **BP-02134** · CAS **115144-35-9** · Form **free base** · Physical state **other** · Color **Light yellow to yellow** · Version **1.0**
 · Revision **2026-09-03**

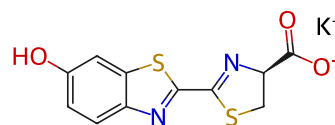
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Target Fluorescent Dye	Research area Others
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Molecular formula **C₁₁H₇KN₂O₃S₂**

Molecular weight **318.4130**

STRUCTURE



DESCRIPTION

D-luciferin potassium is the natural substrate of the enzyme luciferase (Luc) that catalyzes the production of the typical yellowgreen light of fireflies. The 560 nm chemiluminescence from this reaction peaks within seconds, with light output that is proportional to luciferase concentration when the substrate luciferin is present in excess. The luciferase (luc) gene is a popular reporter gene for research and agent screening. Chemiluminescent techniques are virtually background-free, making the luc reporter gene ideal for detecting low-level gene expression. As little as 0.02 pg of luciferase can be reliably measured in a standard scintillation counter. In addition to its role as a reporter of gene expression, luciferase is commonly used in an extremely sensitive assay for ATP . We offer the firefly luciferase , luciferin free acid , as well as its water-soluble sodium salts and potassium salts .

BIOLOGICAL ACTIVITY

In Vitro

Guide (Following is our recommended protocol. This protocol only provides a guideline, and should be modified according to your specific needs).

1. Precautions

1.1 The D-luciferin salts are readily soluble in aqueous buffers (pH 6.1-6.5) up to 100 mM. Stock solutions can be made in ATP-free water and stored at -20 °C protect from light. The free acid must be neutralized with an appropriate base to solubilize. At a higher pH, luciferin undergoes a base-catalyzed formation of dehydroluciferin, as well as racemization to the L-isomer.

1.2 The D-luciferin can be used with any existing reporter assay or ATP assay system.

1.3 If testing for ATP, minimize all possible sources of ATP contamination by wearing gloves and using ATP-free

containers. Use only sterile ATP-free water and reagents. Use autoclaved water for all reagent preparations.

2. Experimental Protocols

2.1 Example protocol for in vitro bioluminescent image assays

- a) Prepare a 100 mM (100-200X) Luciferin stock solution in sterile water. Mix well. Use immediately, or make single use aliquots, and store at -20 °C, avoid freeze-thaw cycles, avoid exposure to the light.
- b) Prepare a 0.5-1 mM working solution of D-Luciferin in pre-warmed tissue culture medium.
- c) Aspirate media from cultured cells.
- d) Add Luciferin working solution to cells, and incubate the cells for 5-10 minutes at 37°C just prior to imaging.

2.2 Example protocol for in vivo bioluminescent image assays

- a) Prepare a 15 mg/mL Luciferin stock solution in DPBS, without Mg²⁺ and Ca²⁺. Mix well.
- b) Filter sterilizes the solution through a 0.2 µm filter. Use immediately, or make single use aliquots, and store at -20 °C, avoid freeze-thaw cycles, avoid exposure to the light.
- c) Inject the luciferin intra-peritoneally (i.p.) 10-15 minutes before imaging at 150 mg/kg (or 10 µL/g of luciferin stock solution) of the animal body weight.

Note: A kinetic study of luciferin should be performed for each animal model to determine peak signal time.

2.3 Example protocol for luciferin reporter assays

- a) Prepare a 100 mM Luciferin stock solution in sterile water. Use immediately, or make single use aliquots, and store at -20 °C, avoid freeze-thaw cycles, avoid exposure to the light.
- b) Prepare a 1 mM working solution of D-Luciferin with 3 mM ATP, 1 mM DTT and 15 mM MgSO₄ in 25 mM tricine buffer pH 7.8.
- c) Pipette 5-10 µL of cell lysate into a microplate. Use lysis reagent or buffer without lysate as a blank.
- d) Prime luminometer with luciferin working solution according to manufacturer's instructions.
- e) Inject 200 µL of luciferin working solution with no delay and a 10 second integration time.

In Vivo

Bioluminescence imaging (BLI) using the firefly luciferase (Fluc) as a reporter gene and D-luciferin as a substrate is currently the most widely employed technique. The total signal intensity is plotted against the time after D-luciferin injection to generate a time-intensity curve. In addition to the peak signal, the signals at fixed time points (5, 10, 15, and 20 min) after D-luciferin injection are determined as alternatives to the peak signal. The signal in a given

time-intensity curve is normalized for the peak signal in the curve to represent the pattern of temporal changes after D-luciferin injection[3].

Inject with 10 μ L of D-luciferin (intraperitoneally or intravenously) stock solution per gram of body weight: normally $\sim$ 200 μ L for a 20 g mouse for a standard 150 mg/kg injection.

Thaw D-Luciferin (either Potassium or Sodium Salt) at room temperature and dissolve in dPBS (no calcium or magnesium) to a final concentration of 15 mg/mL. Pre-wet a 0.22 μ m filter by drawing through 5-10 mL of sterile H₂O and discard water. Sterilize the D-Luciferin solution through the prepared 0.22 μ m syringe filter.

SOLUBILITY

Soluble in H₂O

REFERENCES

[1].Giuseppe Meroni, et al. D-Luciferin, derivatives and analogues: synthesis and in vitro/in vivo luciferase-catalyzed bioluminescent activity. ARKIVOC 2009 (i) 265-288.

[2].Rajesh Shinde, et al. Luciferin derivatives for enhanced in vitro and in vivo bioluminescence assays. Biochemistry. 2006 Sep 19;45(37):11103-12.

[3]. Inoue Y, et al. Timing of imaging after d-luciferin injection affects the longitudinal assessment of tumor growth using in vivo bioluminescence imaging. Int J Biomed Imaging. 2010;2010:471408.

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