Product Information

D-Luciferin

Synthetic

L9504

Product Description

Synonyms: (*S*)-2-(6-Hydroxy-2-benzothiazolyl)-2-thiazoline-4-carboxylic acid, 4,5-Dihydro-2-(6-hydroxy-2-benzothiazolyl)-4-thiazolecarboxylic acid, Firefly Luciferin

Molecular Formula: $C_{11}H_8N_2O_3S_2$

Molecular Weight: 280.3

CAS Number: 2591-17-5

λ_{max}: 268 nm, 330 nm[1]

Extinction Coefficient: E^{mM}= 7.04 (268 nm), 18.2 (330 nm)[1]

Solvent: N_2-sparged ethanol

D-Luciferin is a naturally occurring compound in organisms capable of bioluminescence, such as fireflies. The enzyme luciferase oxidizes D-luciferin to produce a light-emitting excited state molecule.[2,3]

The excitation and emission spectra for D-Luciferin have been published. The excitation is pH-dependent, with a maximum of 327 nm at pH 4 and 385 nm at pH 11. The emission profile is identical at both pH's, with a maximum at 537 nm.[4] The dependence of the bioluminescence of the luciferase-luciferin system on Zn^{2+} concentration has been published.[5]

ATP can be measured with a reagent made up of luciferin and luciferase from firefly. Discussions of extraction buffers for releasing ATP from bacteria and tissues have been published.[6,7] If D-luciferin is used for assaying the concentration of ATP in cell lysates, it is important to know if ATPases are present. These enzymes must be inactivated in the extraction process so that the ATP is not destroyed. Heat or low pH are usually used and do not affect the integrity of the ATP.

Several theses[8] and dissertations[9-15] cite use of product L9504 in their research protocols.

Precautions and Disclaimer

This product is for R&D use only. Not for drug, household, or other uses. Please consult the Safety Data Sheet for information regarding hazards and safe handling practices.

Solubility

D-luciferin is tested for solubility in DMSO at 10 mg/mL.

To solubilize luciferin free base in water:

- Bubble nitrogen through distilled water.
- Stir in the luciferin. It will not dissolve.
- Add as close to 1 equivalent as possible of $NaHCO_3$. Allow the $NaHCO_3$ to stir slowly at room temperature. It will take about 30 minutes to solubilize.
- The solution should be a faint yellow solution at a pH of approximately 6.5. If too much sodium bicarbonate is added, the solution will be too alkaline, and the luciferin will oxidize and form a green solution.

Preparation Instructions

Do **not** use Tris-HCl to prepare solutions of D-luciferin. If the application requires a Tris buffer, Tris-acetate buffer is recommended instead.

Solutions of D-luciferin in ice-cold 0.1 M Tris-acetate buffer, pH 7.5-7.75, prepared at 4 °C and protected from light (amber bottle in ice bath) are stable for 8-24 hours at 4 °C. In general, it is not recommended to store D-luciferin solutions frozen, although several publications report freezing of luciferin stock solutions under conditions that we have not ourselves tested:

- 10 mM stock solution in water:methanol (10 mg of D-luciferin in 2.57 mL water + 1 mL of MeOH), stored at –20 °C[16]
- 100 mM stock solution at –80 °C[17]

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