Product Information

Luminol

≥97% (HPLC)

A8511

Product Description

Synonyms: 5-amino-2,3-dihydro-1,4-phthalazinedione, 3-aminophthalhydrazide

CAS Registry Number: 521-31-3

Molecular Formula: $C_8H_7N_3O_2$

Molecular Weight: 177.16

Melting Point: 319-320 °C

5-amino-2,3-dihydro-1,4-phthalazinedione, known commonly as luminol, is a cyclic diacyl hydrazide compound that is a widely used reagent for chemluminescence, when used in conjunction with oxidizing agents. Luminol is readily oxidized in basic solution, with the release of energy as visible light. The reaction can be carried out in various media, including protic solvents such as water, and aprotic solvents such DMSO or DMF. The mechanism of oxidation varies with the solvent, and slightly different conditions are needed:

- In aprotic media, only molecular oxygen and a strong base are needed to produce chemiluminescence (λ_{max} = 485 nm).
- In aqueous systems, a strong base (either molecular oxygen or a peroxide) and an auxiliary oxidant (such as hypochlorite or perborate) are required for chemiluminescence (λ_{max} = 425 nm).

The actual form that emits light is the aminophthalate ion.[1] Various applications of luminol include:

- Microestimation of glucose and glucose oxidase using enzyme-induced chemiluminescence[2,3]
- Inhibitor of poly ADP Ribose Synthase[4]
- Blood detection[5-8]
- Demonstrations of the phenomenon of chemiluminescence, using different sensitizers to produce different colors of light

The chemiluminescence spectrum of luminol indicates greatest relative intensity at 425 nm, with an optimal pH of 9-10.[1]

Several dissertations[9-13] have cited use of product A8511 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.

Storage/Stability

Luminol is stable at room temperature if stored protected from light.

Solubility

This product is tested for solubility at 50 mg/mL in DMSO. Luminol free acid is comparatively insoluble in water but is quite soluble in base. The sodium salt of luminol (Cat. No. A4685) is readily soluble in water, such as at 50 mg/mL.

Solutions are very sensitive to light and the presence of metal cations. Typically, they are only stable for 8-12 hours.[14] Luminol in both its free acid and sodium salt forms can undergo photochemical changes to give several compounds which are significantly inhibitory to enhanced chemiluminescence.[15] Luminol in its solid and solution forms should be protected from light and high temperature.[15]

Procedure

Analytical test for copper

1. Dissolve 0.1 g Luminol in 10 mL concentrated ammonia. Dilute with 100 mL water.
2. Before use, dilute 1 mL of this solution with 4 mL distilled water. Mix with 0.5 mL of 3% H_2O_2.

3. To 0.5 mL of this reagent solution in a small test tube, add the test solution containing iron(II) or copper(II). This mixture glows with a blue-violet luminescence in the presence of as little as 0.13 µg of copper or 0.25 µg of iron. The dilution limit is 1:2,500,000. A standard curve established with a photometer permits quantitative determination.

References

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