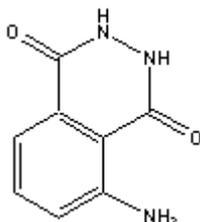


Catalog Number: 195038

5-Amino-2,3-dihydro-1,4-phthalazinedione

Structure:



Molecular Formula: C₈H₇N₃O₂

Molecular Weight: 177.16

CAS # 521-31-3

Synonyms: Luminol; 3-Aminophthalhydrazide; o-Aminophthaloyl hydrazide

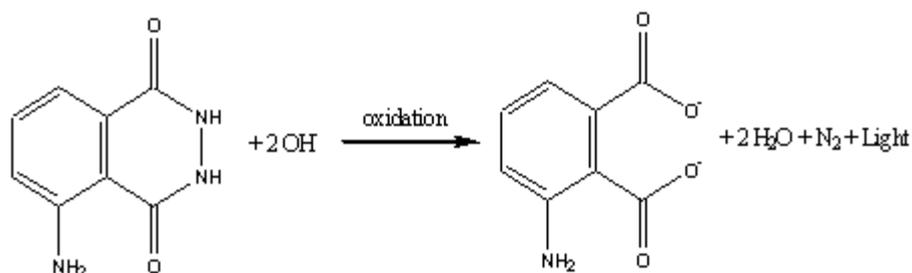
Physical Description: Yellow to brown powder

Optimal pH: 9-10.⁹

Solubility: Soluble in DMSO (50 mg/ml - clear to hazy, yellow to yellow-green solution); soluble in bases; soluble in 2% N NaOH (clear-yellow solution); insoluble in water. Solutions are very sensitive to light and the presence of metal cations. Solutions are typically stable only about 8-12 hours.⁵

Description: 5-Amino-2,3-dihydro-1,4-phthalazinedione is readily oxidized in basic solution, with the release of energy as visible light. The reaction can be carried out in a variety of media including protic solvents such as water, and aprotic solvents (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 ($\lambda_{\text{max}} = 485 \text{ nm}$). 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 ($\lambda_{\text{max}} = 425 \text{ nm}$. The chemiluminescence spectrum of 5-Amino-2,3-dihydro-1,4-phthalazinedione indicates greatest relative intensity at 425 nm⁹). The actual form that emits light is the

aminophthalate ion.⁹



Typical applications include microestimation of glucose and glucose oxidase using enzyme-induced chemiluminescence^{3,7}, inhibitor of poly ADP Ribose Synthase², and demonstrations of the phenomenon of chemiluminescence using different sensitizers to produce different colors of light.¹⁰

Typical Presumptive test for blood^{5, 13}: 3.5 g of Sodium perborate is added to 500 ml distilled water and thoroughly dissolved. 25 g of sodium carbonate and 9.5 g 5-Amino-2,3-dihydro-1,4-phthalazinedione are then added and dissolved. The solution is allowed to stand for five minutes to allow any undissolved chemicals to settle. The solution is then decanted into a plastic spray bottle and is ready to use. It should be applied as a fine mist on the surface to be tested. Bloodstains will luminesce with an even glow that will last for several seconds (for best results, the area should be as dark as possible).

This is not a definitive test for blood since it is the iron in the heme which catalyzes the oxidation and the subsequent chemiluminescence. The presence of copper as a contaminant will accelerate the oxidation process.

Solutions can be tested by spraying on a clean piece of copper such as a penny.

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