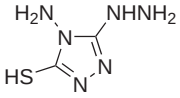
6000 N. Teutonia Avenue
Milwaukee, Wisconsin 53209 USA
Telephone: (800) 231-8327 • (414) 438-3850
Fax: (414) 438-4234
email: techservice@sial.com
sigma-aldrich.com

TechnicalBulletin

Purpald®

(4-Amino-3-hydrazino-5-mercapto-1,2,4-triazole; 4-Amino-5-hydrazino-4H-1,2,4-triazole-3-thiol)

Catalog Numbers: 162892 and 08095
Technical Bulletin AL-145



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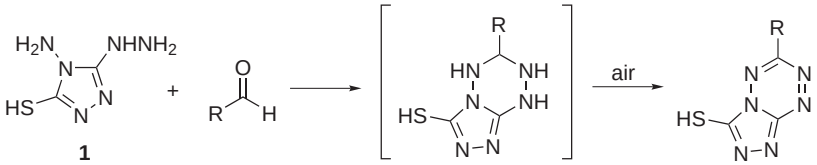
Properties:

CAS No. 1750-12-5
Formula weight: 146.17
Appearance: white powder
Molecular formula: $C_2H_6N_6S$
Melting point: 230–231 °C (dec.)

Dickinson and Jacobsen[1] have described the exceedingly specific and sensitive (up to 10^{-4} M sensitivity) reaction of aldehydes with Purpald® (**1**) to yield purple-to-magenta-colored 6-mercapto-s-triazolo[4,3-*b*]-s-tetrazines (**2**). Ketones, esters, formic acid, amides, hydroxylamines, quinones, uric acid, hydrazines and aminophenols do not react with **1** to yield purple products.



1 **2**

Procedure for Detection of Aldehydes

One drop of the aldehyde is added to 10–20 mg of Purpald dissolved in 2 mL of 1 N sodium hydroxide. Aeration of the reactants produces the intense color within a few minutes. Very hindered aldehydes may require longer reaction times. **Table 1** lists some representative aldehydes and reaction times necessary for color changes.

Table 1*

Aldehyde	Color	Time
5-Hydroxypentanal	purple	<30 seconds
Crotonaldehyde	purple	–
Benzaldehyde	purple	<1 minute
2-Nitrobenzaldehyde	purple-brown	<30 seconds
trans-Cinnamaldehyde	purple	<5 minutes
α-Methylcinnamaldehyde	purple	<10 minutes
β-Phenylcinnamaldehyde	purple	–
4-Acetamidobenzaldehyde	purple-brown	<5 minutes
2-Chloro-6-nitrobenzaldehyde	purple	<5 minutes
10-Methylanthracene-9-carboxaldehyde	purple	very slow

* Tests were performed in the Aldrich Quality Control Laboratories

Applications

Since the original work by Dickinson and Jacobsen,[1] a variety of methods and applications have been developed for the detection of aldehydes with Purpald. The reagent has been used in conjunction with enzymatic systems for the colorimetric detection of creatinine,[2] free fatty acids,[3] and uric acid.[4] Also, triglycerides have been determined in biological samples.[5–8]

Other applications from current literature include the detection of:

- formaldehyde in periodate-oxidized glycols,[9] air,[10] vaccines,[11] urea/formaldehyde resins,[12,13] and plastic products;[14]
- acetaldehyde in liver tissue sections[15] and on the surface of spoiling fruit;[16]
- formaldehyde generated from alkyl 2-cyanoacrylate vapor in air.[17]

Purpald is also used in TLC spray reagents,[18] filter paper test strips,[19] and phase-transfer catalysis.[20]

Storage and Stability

Purpald should be stored in well closed containers at room temperature. It is relatively stable under normal laboratory conditions.

Toxicity and Handling

To the best of our knowledge, the chemical, physical and toxicological properties have not been thoroughly investigated. The usual safe laboratory precautions and procedures should be observed when handling this material.

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Aldrich Chemical Company, Inc.
P.O. Box 355, Milwaukee, WI 53201 USA
Technical Service 800-325-5832
sigma-aldrich.com/techservice

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