



3050 Spruce Street
Saint Louis, Missouri 63103 USA
Telephone 800-325-5832 • (314) 771-5765
Fax (314) 286-7828
email: techserv@sial.com
sigma-aldrich.com

Product Information

Propyl gallate

Product Number **P 3130**
Store at Room Temperature

Product Description

Molecular Formula: $C_{10}H_{12}O_5$
Molecular Weight: 212.2
CAS Number: 121-79-9
Melting Point: 150 °C¹
pK_a: 8.11¹
 λ_{max} : 272 nm (1 M HCl)
Extinction Coefficient: $E^{1\%1cm} = 10.2$ (272 nm, 1 M HCl)
Partition Coefficient: 32 (octanol:water),
17 (oleyl alcohol:water)¹
Synonyms: n-propyl gallate; 3,4,5-trihydroxybenzoic acid propyl ester; gallic acid propyl ester¹

Propyl gallate is a compound with antioxidant properties that is used in the production of cosmetics, fats, oils, ethers, emulsions, and waxes.¹ A review of the use of propyl gallate and other compounds as antioxidants has been published.² A discussion of *in vivo* toxicology studies of propyl gallate and other gallic acid esters has been reported.³ The synthesis of propyl gallate by transesterification of tannic acid with tannase from *Aspergillus niger van Teighem* has been described.⁴

Propyl gallate has been used to probe the cyanide-insensitive alternative oxidase pathway of oxygen uptake in seeds of *Orobanche aegyptiaca*.⁵ A study of cultured lens epithelial cells treated with H₂O₂ has indicated that propyl gallate dismutates superoxide ion in a catalytic manner and thus mimics superoxide dismutase activity.⁶ Propyl gallate (1 mM) has been utilized to probe the activity of plastid oxidase from *Arabidopsis thaliana* as expressed in tobacco.⁷ A report has investigated the utility of propyl gallate with a gold cluster/fluorochrome-labeled antibody probe for immunofluorescence microscopy and immunoelectron microscopy.⁸

Precautions and Disclaimer

For Laboratory Use Only. Not for drug, household or other uses.

Preparation Instructions

This product is soluble in ethanol (50 mg/ml), with heat as needed, yielding a clear, colorless to faint yellow solution. It is soluble in water (3.5 mg/ml).¹

Storage/Stability

This product darkens in the presence of iron and iron salts.¹

References

1. The Merck Index, 12th ed., Entry# 8044.
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3. van der Heijden, C. A., et al., Toxicology of gallates: a review and evaluation. *Food Chem. Toxicol.*, **24(10-11)**, 1067-1070 (1986).
4. Sharma, S., and Gupta, M. N., Synthesis of antioxidant propyl gallate using tannase from *Aspergillus niger van Teighem* in nonaqueous media. *Bioorg. Med. Chem. Lett.*, **13(3)**, 395-397 (2003).
5. Bar Nun, N., et al., Changes in the activity of the alternative oxidase in *Orobanche* seeds during conditioning and their possible physiological function. *Phytochemistry*, **64(1)**, 235-241 (2003).
6. Reddan, J. R., et al., Propyl gallate is a superoxide dismutase mimic and protects cultured lens epithelial cells from H₂O₂ insult. *Exp. Eye Res.*, **76(1)**, 49-59 (2003).

7. Joet, T., et al., Involvement of a plastid terminal oxidase in plastoquinone oxidation as evidenced by expression of the *Arabidopsis thaliana* enzyme in tobacco. J. Biol. Chem., **277(35)**, 31623-31630 (2002).
8. Takizawa, T., and Robinson, J. M., Analysis of antiphotobleaching reagents for use with FluoroNanogold in correlative microscopy. J. Histochem. Cytochem., **48(3)**, 433-436 (2000).

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