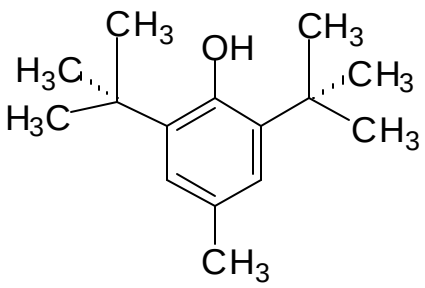
3050 Spruce Street
Saint Louis, Missouri 63103 USA
Telephone (800) 325-5832 (314) 771-5765
Fax (314) 286-7828
email: techserv@sial.com
sigma-aldrich.com

ProductInformation

2,6-Di-*tert*-butyl-4-methylphenol
Product Number **B1378**
Storage Temperature RT

CAS #: 128-37-0
Synonyms: BHT; 3,5-di-t-butyl-4-hydroxytoluene; 2,6-di-t-butyl-p-cresol; methyl-di-t-butylphenol

Product Description



Appearance: white powder
Molecular formula: $C_{15}H_{24}O$
Molecular weight: 220.4
Purity: minimum 99.0% (GC)
Melting point: 70°C
Boiling point: 265°C
E^{mM}(278 nm)=1.75-1.83 (in methanol)

Butylated hydroxytoluene (BHT) is a phenolic antioxidant and free radical scavenger. It has been shown to inhibit lipid peroxidation.[1] It is considered a pulmonary toxin and tumor promotor in mice. This activity may be due to a metabolite of BHT, 6-tert-butyl-2-[2'-(2'-hydroxymethyl)-propyl]-4-methylphenol (BHTOH), which is formed by the hydroxylation of a tert-butyl group on BHT.[2] BHTOH has been shown to be more effective than BHT in causing lung damage and promoting tumors. Metabolites of BHT have also been reported to induce DNA strand breaks and internucleosomal DNA fragmentation (a characteristic of apoptosis) in cultured cells.[3] In rats, a single intraperitoneal injection of BHT (60 mg/kg body mass) results in a significant increase in nuclear DNA methyl transferase activity in the liver, kidneys, heart, spleen, brain and lungs. In addition to changes in methyl transferase activity, BHT causes tissue-specific reversible changes in methylation of total DNA and various specific genes such as those for rat liver cytosine DNA-methyl transferase, renal methyl transferase, and hepatic c-Ha-ras.[4]

Incubation of alveolar macrophages with BHT significantly reduced the level of TNF-α which may explain the mechanism by which this antioxidant reduces inflammation.[5] Preincubation of aspirin-treated platelets with BHT inhibited the secretion, aggregation, and protein phosphorylation induced by the protein kinase C activators, dioctanoylglycerol or phorbol 12-myristate 13-acetate (PMA).[6] BHT has also been found to inhibit the initiation of hepatocarcinogenesis by aflatoxin B1.[7]

Preparation Instructions

Soluble in ethanol at 100 mg/ml. Sonication may be needed. Practically insoluble in water, but freely soluble in vegetable oils, acetone, chloroform and ether.

Storage/Stability

The solid is expected to be stable at room temperature for at least two years from date of delivery. Traces of metals can lead to loss of activity and solutions are not compatible with oxidizing agents or ferric salts.

Precautions/Disclaimer

Limited test results suggest that BHT may be a carcinogen/tumorigen.

References

1. Shih, M.K., and Hu M.L., Mutat. Res., 438, 125-132 (1999).
2. Dwyer-Nield, L.D. et al., Toxicology, 130, 115-27 (1998).
3. Oikawa, S. et al., Biochem. Pharmacol., 56, 361-370 (1998).
4. Vanyushin, B.F. et al., Eur. J. Biochem., 256, 518-527 (1998).
5. Hulten, L.M. et al., Transplantation, 66, 364-369 (1998).
6. Ruzzene, M. et al., Arch. Biochem. Biophys., 294, 724-730 (1992).
7. Williams, G.M., and Iatropoulos, M.J., Cancer Lett., 104, 49-53 (1996).

ALC 9/22/99