

PRODUCT DATA SHEET

Docosanoic acid

Catalog number: 1035

Common names: Behenic acid; C22:0 Fatty acid

Source: natural, plant

Solubility: chloroform, ethyl ether

CAS number: 112-85-6

Molecular Formula: C₂₂H₄₄O₂

Molecular Weight: 341

Storage: room temperature

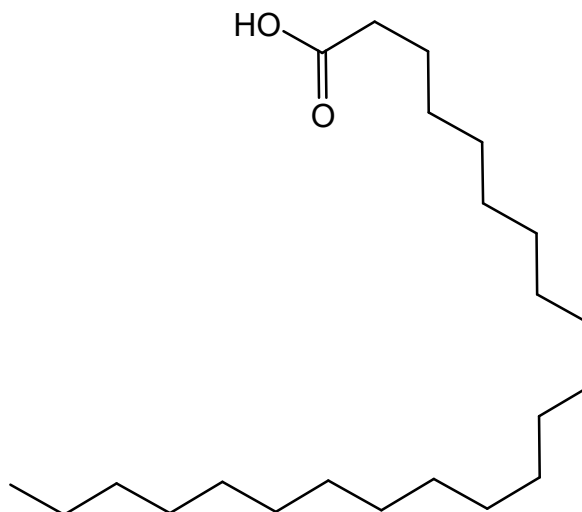
Purity: TLC: 99%, GC >99%

TLC System: hexane/ethyl ether/acetic acid
(85:15:1)

Appearance: solid

Application Notes:

This high purity fatty acid is ideal as a standard and for biological studies. During the metabolism of docosanoic acid it is converted to the *omega*-hydroxy docosanoic acid and then to the dicarboxylic docosanedioic acid.¹ Long chain fatty acids have been found to inhibit the double-stranded DNA binding activity of p53 DNA binding domain, with docosanoic acid showing the highest inhibitory activity, suggesting that fatty acids in the cell membrane might regulate the activity of p53 for cell division, cell-cycle checkpoint, and tumor suppression.² X-linked adrenoleukodystrophy (X-ALD) is an inherited disorder of peroxisomal metabolism and is characterized by deficient *beta*-oxidation of saturated very long chain fatty acids (VLCFA) resulting in an accumulation of VLCFA and a subsequent decrease in shorter fatty acids such as docosanoic acid. In plants VLCFA are converted to long chain hydrocarbons which are used to make waxes that are essential to their survival.³ Long chain fatty acids acylated to sphingolipids are critical in many biological functions⁴ and substantial amounts are found to be amide-linked to the long-chain sphingoid base sphinganine, forming a ceramide, which constitutes the lipid backbone of sphingomyelin and other sphingolipids. Long chain fatty acids can often be found in esterified linkages with cholesterol, gangliosides, galactocerebrosides, sphingomyelin, and phosphatidylcholine.



Selected References:

1. R. Sanders et al. "Evidence for two enzymatic pathways for ω -oxidation of docosanoic acid in rat liver microsomes" *Journal of Lipid Research*, vol. 46 pp. 1001-1008, 2005
2. H. Iijima et al. "The Inhibitory Action of Long-Chain Fatty Acids on the DNA Binding Activity of p53" *Lipids*, vol. 41 pp. 521-527, 2006
3. A. Millar et al. "CUT1, an Arabidopsis Gene Required for Cuticular Wax Biosynthesis and Pollen Fertility, Encodes a Very-Long-Chain Fatty Acid Condensing Enzyme" *Plant Cell*, Vol. 11 pp. 825-838, 1999
4. P. Tvrđika et al. "Role of a New Mammalian Gene Family in the Biosynthesis of Very Long Chain Fatty Acids and Sphingolipids" *Journal of Cell Biology*, Vol. 149(3) pp. 707, 2000

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