

PRODUCT DATA SHEET

Methyl dodecanoate

Catalog number: 1009

Common Name: Methyl laurate; C12:0 methyl ester

Source: natural, plant

Solubility: chloroform, ethanol, ethyl ether

CAS number: 111-82-0

Molecular Formula: C₁₃H₂₆O₂

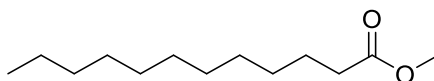
Molecular Weight: 214

Storage: room temperature

Purity: TLC: 99%, GC: 99%

TLC System: hexane/ethyl ether (90:10 by vol.)

Appearance: liquid



Application Notes:

This high purity fatty acid methyl ester is ideal as a standard and for biological studies. During the metabolism of dodecanoic acid it is converted to the *omega*-hydroxy dodecanoic acid and then to the dicarboxylic dodecanedioic acid. In some marine organisms dodecanoic acid is hydroxylated in other positions as well as at the terminal position.¹ Long chain fatty acids have been found to inhibit the double-stranded DNA binding activity of p53 DNA binding domain suggesting that fatty acids in the cell membrane might regulate the activity of p53 for cell division, cell-cycle checkpoint, and tumor suppression.² Dodecanoic acid in rat liver cells can be desaturated to n-3 dodecenoic acid which may be the first step in the biosynthesis of α -linolenic acid.³ X-linked adrenoleukodystrophy (X-ALD) is an inherited disorder of peroxisomal metabolism and is characterized by deficient β -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 dodecanoic acid. Long chain fatty acids acylated to sphingolipids are critical in many biological functions 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. Dodecanoic acid, as a saturated fatty acid, has been found to cause moderate risk of coronary heart disease as compared with polyunsaturated fatty acids and significantly lowers the total cholesterol/high density lipoprotein-cholesterol ratio as compared with carbohydrates.⁴

Selected References:

1. P. Lemaire et al. "Subterminal hydroxylation of lauric acid by microsomes from a marine fish" *Lipids*, vol. 27 pp. 187-191, 1992
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. P. Legrand et al. "Lauric acid is desaturated to 12:1n-3 by hepatocytes and rat liver homogenates" *Lipids*, vol. 37 pp. 569-572, 2002
4. R. Micha and D. Mozaffarian "Saturated Fat and Cardiometabolic Risk Factors, Coronary Heart Disease, Stroke, and Diabetes: a Fresh Look at the Evidence" *Lipids*, vol. 45 pp. 893-905, 2010

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