

PRODUCT DATA SHEET

Tetradecanoic acid

Catalog number: 1010

Common names: Myristic acid; C14:0 Fatty acid

Source: natural, plant

Solubility: chloroform, ethanol, ethyl ether

CAS number: 544-63-8

Molecular Formula: C₁₄H₂₈O₂

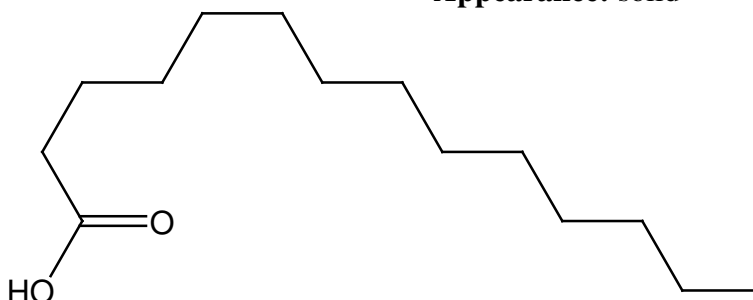
Molecular Weight: 228

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. Tetradecanoic acid is a long-chain saturated fatty acid that is found in many organisms and has widespread commercial uses such as flavorings, soaps, and cosmetics. Serum free tetradecanoic acid has been proposed as a predictor to differentiate nonalcoholic steatohepatitis from simple steatosis.¹ During their metabolism fatty acids are converted to *omega*-hydroxy fatty acids and then to dicarboxylic fatty acids. 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 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 tetradecanoic acid. Palmitoyl-myristoyl-phosphatidylcholine is one of the major components of surfactant and can exert specific effects on macrophage differentiation.³ 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. Tetradecanoic 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. K. Tomita et al. "Plasma Free Myristic Acid Proportion Is a Predictor of Nonalcoholic Steatohepatitis" *Digestive Diseases and Sciences*, vol. 56 pp. 3045-3052, 2011
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. W. Bernhard et al. "Increased palmitoyl-myristoyl-phosphatidylcholine in neonatal rat surfactant is lung specific and correlates with oral myristic acid supply" *Journal of Applied Physiology*, vol. 111 pp. 449-457, 2011
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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