

PRODUCT DATA SHEET

Methyl decanoate

Catalog number: 1261

Common names: C10:0 Methyl ester; Methyl caprate

Source: natural, plant

Solubility: hexane, chloroform

CAS number: 110-42-9

Molecular Formula: C₁₁H₂₂O₂

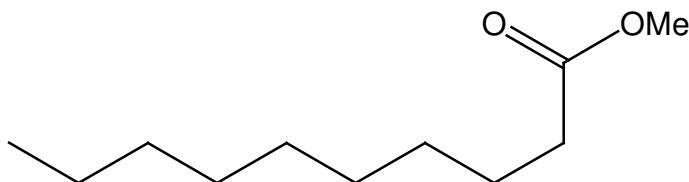
Molecular Weight: 186

Storage: room temperature

Purity: GC: 99%, TLC: 99%

TLC System: hexane/ethyl ether (90:10)

Appearance: liquid



Application Notes:

This high purity fatty acid methyl ester is ideal as a standard and for biological studies. Decanoic acid is a medium-chain saturated fatty acid that is found in many organisms and has widespread commercial uses, such as flavorings, soaps, cosmetics, supplements, and dietetics. Decanoic acid has been found to be a direct ligand of peroxisome proliferator-activated receptor (PPAR) -*gamma* (a nuclear receptor that plays key roles in glucose and lipid metabolism) and partially activates the receptor without inducing adipogenesis. This fatty acid/receptor interaction can be used to design better and safer PPAR-*gamma*-based drugs.¹ Decanoic acid has been found to have excellent antibacterial and antifungal activities and unique solvency properties.² It has found application in extracting herbicides from water and (as mono and diglycerides) as a cholesterol dissolving agent in patients having cholesterol gallstones. Decanoic acid has been used as an oral absorption enhancer of insulin.³ As a food supplement it shows evidence of improving blood lipids, enhancing antioxidant protection and reducing lipid peroxidation.⁴ 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 decanoic acid. Sphingolipids are normally acylated with long-chain fatty acids and are critical in many biological functions. When acylated with shorter fatty acids these sphingolipids can more easily cross the cell membrane barrier. Decanoic acid is a saturated fatty acid and saturated fatty acids have been found to cause moderate risk of coronary heart disease as compared with polyunsaturated fatty acids and they significantly lower the total cholesterol/high density lipoprotein-cholesterol ratio as compared with carbohydrates.⁵

Selected References:

1. R. Malapaka et al. "Identification and Mechanism of a Ten Carbon Fatty Acid as a Modulating Ligand of Peroxisome Proliferator-Activated Receptors" *Journal of Biological Chemistry*, doi:10.1074/jbc.M111.294785, 2011
2. A. Kumar et al. "Synthesis, Antimicrobial Evaluation, QSAR and *In Silico* ADMET Studies of Decanoic Acid Derivatives" *Acta Poloniae Pharmaceutica - Drug Research*, vol. 68 pp. 191-204, 2011
3. M. Radwan and H. Aboul-Enein "The effect of oral absorption enhancers on the in vivo performance of insulin-loaded poly(ethylcyanoacrylate) nanospheres in diabetic rats" *Journal of Microencapsulation*, vol. 19 pp. 225-235, 2002
4. A. Sengupta and M. Ghosh "Comparison of native and capric acid-enriched mustard oil effects on oxidative stress and antioxidant protection in rats" *British Journal of Nutrition*, DOI:10.1017/S0007114511003874, 2011
5. 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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