

PRODUCT DATA SHEET

Nonanoic acid

Catalog number: 1163

Common names: C9:0 Fatty acid; Pelargonic acid

Source: synthetic

Solubility: chloroform, ethanol, ethyl ether

CAS number: 112-05-0

Molecular Formula: C₉H₁₈O₂

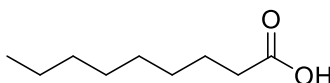
Molecular Weight: 158

Storage: room temperature

Purity: TLC: 99%, GC: 99%

TLC System: hexane/ethyl ether/acetic acid
(80:20:1 by vol.)

Appearance: liquid



Application Notes:

This high purity nonanoic acid is ideal as a standard and for biological studies. Odd numbered fatty acids occur in small amounts in mammals but are found in much larger amounts in bacteria and in some plants (especially in pelargonium) and lower animals. Due to difficulties in their identification the properties and functions of odd numbered fatty acids have not been fully studied, but with better analytical techniques and high purity standards they are now gaining more prevalence in research.¹ Odd numbered fatty acids are found in small amounts acylated to various sphingolipids where they have unique properties and functions.² Microbial fatty acid profiles, which often contain significant amounts of odd numbered fatty acids, are unique from one species to another and can therefore be used in the determination of bacterial identity. Nonanoic acid and its esters are used as herbicides (both as the free acid and as ammonium nonanoate), flavorings, and in the biosynthesizing of polyhydroxyalkenoates. It induces irritancy of the skin but both its mechanism and gene activation are different from other skin irritants.³ Nonanoic acid has been found to be a fungal self inhibitor of *Rhizopus oligosporus*.⁴ 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. Nonanoic 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. T. Rezanka and K. Sigler "Odd-numbered very-long-chain fatty acids from the microbial, animal and plant kingdoms" *Progress in Lipid Research*, vol. 48 pp. 206-238, 2009
2. A. Hajra and N. Radin "Biosynthesis of the cerebroside odd-numbered fatty acids" *Journal of Lipid Research*, vol. 3 pp. 327-332, 1962
3. A. Clemmenson et al. "Genome-Wide Expression Analysis of Human In Vivo Irritated Epidermis: Differential Profiles Induced by Sodium Lauryl Sulfate and Nonanoic Acid" *Journal of Investigative Dermatology*, vol. 130 pp. 2201-2210, 2010
4. P. Breeuwer et al. "Nonanoic Acid, a Fungal Self-Inhibitor, Prevents Germination of *Rhizopus oligosporus* Sporangiospores by Dissipation of the pH Gradient" *Applied and Environmental Microbiology*, vol. 63 pp. 178-185, 1997
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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