

PRODUCT DATA SHEET

Methyl docosenoate (*cis*-13)

Catalog number: 1265

Common name: Methyl erucate; C22:1 (*cis*-13) Methyl ester

Source: natural, plant

Solubility: chloroform, hexane, ethyl ether

CAS number: 1120-34-9

Molecular Formula: C₂₃H₄₄O₂

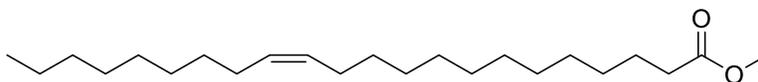
Molecular Weight: 353

Storage: -20°C

Purity: TLC: 99%, GC >99%

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

Appearance: solid



Application Notes:

This high purity *omega*-9 very long-chain fatty acid methyl ester is ideal as a standard and for biological studies. *cis*-13 Docosenoic acid (erucic acid) is biosynthesized from *cis*-11 eicosenoic acid and is the precursor for nervonic acid which is critical for the central nervous system. Erucic acid is not prevalent in animal tissues although it is slightly more common in cardiolipin. It is very prevalent in many plant oils, sometimes being the most abundant fatty acid in the plant. There are concerns that high concentrations of erucic acid (>10% fatty acid content) in mammalian diet may lead to lipidosis (such as X-linked adrenoleukodystrophy which is characterized by an accumulation of very long-chain saturated fatty acids) and thrombocytopenia.¹ However, erucic acid has also been used as a supplement to treat X-linked adrenoleukodystrophy, especially in the early stages of the disease.² Erucic acid used to treat X-linked adrenoleukodystrophy is quickly converted, in the central nervous system, to nervonic acid or oleic acid thereby diluting the concentration of the accumulated very long-chain saturated fatty acids and diminishing their damaging effects.³ Erucic acid is considered non-edible or even toxic for human and animal consumption. Canada and the European Union set a <5% limit on edible oils containing erucic acid while the United States set a <2% limit. However, the health concerns about erucic acid are still being disputed.⁴ Erucic acid is thought to reduce the rate of fatty acid oxidation and cause myocardial lipidosis. There are still concerns that canola oil, containing low amounts of erucic acid, can cause an accumulation of triglycerides in the heart but this claim is disputed.⁵ Erucic acid is prevalent in rapeseed oil due to which the canola plant was genetically engineered (from rapeseed plant) to have a low erucic acid content. Erucic acid is used in the production of plastics, films, and other products.

Selected References:

1. J. Kramer et al. "Effects of dietary saturated fat on erucic acid induced myocardial lipidosis in rats" *Lipids*, vol. 27 pp. 619-623, 1992
2. C. Murphy, E. Murphy, and M. Golovko "Erucic Acid is Differentially Taken up and Metabolized in Rat Liver and Heart" *Lipids*, vol. 43 pp 391, 2008
3. H. Moser et al. "Follow-up of 89 asymptomatic patients with adrenoleukodystrophy treated with Lorenzo's oil" *Arch Neurol.*, vol. 62 pp. 1073-1080, 2005
4. J. Li et al. "Evaluating the trans Fatty Acid, CLA, PUFA and Erucic Acid Diversity in Human Milk from Five Regions in China" *Lipids*, vol. 44 pp. 257-271, 2009
5. T. Green and S. Innis "Low erucic acid canola oil does not induce heart triglyceride accumulation in neonatal pigs fed formula" *Lipids*, vol. 35 pp. 607-612, 2000

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