



SIGMA-ALDRICH

3050 Spruce Street
Saint Louis, Missouri 63103 USA
Telephone 800-325-5832 • (314) 771-5765
Fax (314) 286-7828
email: techserv@sial.com
sigma-aldrich.com

Product Information

Linolenic acid

Product Number **L 2376**

Storage Temperature -0 °C

Replacement for Product Code 85,601-0

Product Description

Molecular Formula: C₁₈H₃₀O₂

Molecular Weight: 278.4

CAS Number: 463-40-1

Melting Point: -10.6 °C¹

Boiling Point: 230-232 °C (1 mm Hg)

Synonym: α-linolenic acid.

Linolenic acid is a component of some plant seed oils.² Plant derived oils such as linseed oil are a source for its isolation.³ Linolenic acid is an essential fatty acid.³

Polyunsaturated fatty acids (such as linolenic acid) autooxidize by three competing pathways.⁶ After formation of a peroxy radical, the following can occur:

- 1) abstraction of hydrogen atoms to give hydroperoxide products,
- 2) beta-scission of the carbon-oxygen bond to give back carbon radicals, including isomerized carbon radicals,
- 3) cyclizing to give a cyclic peroxy radical.

A procedure for determination of the amount of oxidation in a lipid by way of the oxidation index has been published.⁴ The oxidation index is a ratio of the absorbance at 233 nm to the absorbance at 215 nm. The latter wavelength was chosen since there is little contribution of the fatty acid carbonyl to the absorbance at this wavelength, thus allowing Beers Law to be followed.

Lipid oxidation, mechanisms, products and biological significance for fatty acids, including linolenic acid and oleic acid has been discussed.^{5,7}

Precautions and Disclaimer

For Laboratory Use Only. Not for drug, household or other uses.

Preparation Instructions

Linolenic acid is not soluble in water. It is soluble in ethanol, ether, and chloroform.⁸

References

1. Holman, R. T., and Elmer, O. C., The Rates Of Oxidation Of Unsaturated Fatty Acids And Esters. *J. Am. Oil Chem. Soc.*, **24**, 127-129 (1947).
2. *Oil Crops of the World*, Robbelen, G., et al., eds., McGraw-Hill (New York, NY: 1989), pp. 66-67.
3. The Merck Index, 12th ed., Entry# 5530.
4. Klein, R. A., The Detection Of Oxidation In Liposome Preparations. *Biochim. Biophys. Acta.*, **210(3)**, 486-489 (1970).
5. Frankel, E. N., Lipid Oxidation: Mechanisms, Products and Biological Significance. *J. Am. Oil Chem. Soc.*, **61(12)**, 1908-1916 (1984).
6. Fox, J., Fatty Acids' Spontaneous Oxidation Clarified. *Chemical and Engineering News*, Oct. 26, 18-19 (1981).
7. Kim, R. S., and LaBella, F. S., Comparison Of Analytical Methods For Monitoring Autooxidation Profiles Of Authentic Lipids. *J. Lipid Res.*, **28(9)**, 1110-1117 (1987).
8. *Data for Biochemical Research*, 3rd ed., Dawson, R. M. C., et al., Oxford University Press (New York, NY: 1986), pp. 176-177.

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