

Product Information

Vanillin

Product Number **V 2375**
Storage Temperature 2-8 °C

Product Description

Molecular Formula: C₈H₈O₃
Molecular Weight: 152.2
CAS Number: 121-33-5
Melting Point: 80-81 °C¹
Boiling Point: 285 °C¹
Extinction coefficient: E^{mM} = 8.85 (248 nm, 0.01 N NaOH, pH 12.3), 25.1 (347 nm, 0.01 N NaOH, pH 12.3)²
Synonyms: vanillic aldehyde, 4-hydroxy-3-methoxybenzaldehyde.

Vanillin occurs naturally in vanilla and in potato parings. It undergoes oxidation on exposure to moist air. It can be made synthetically from eugenol or guaiacol and from wood pulp waste (lignin). One part vanillin equals 400 parts vanilla pods. Vanillin has been used as a reagent in analytical chemistry, a flavoring agent, and in perfumery.¹ Its use in several chromatography spray reagents for the detection of biochemical compounds has been published.³

Vanillin was one of seven phenolic compounds studied for their protective properties against hydrogen peroxide-induced DNA damage in human peripheral blood lymphocytes. Vanillin, curcumin, and resveratrol protected against DNA damage induced by 50 μM H₂O₂ at a concentration range of 6.25 - 25 μM.⁴

Vanillin and five other phenolic compounds (protocatechuic acid, syringic acid, p-coumaric acid, gallic acid, and L-tyrosine) were chosen for a demonstration of degradation by the photo-Fenton reaction, under artificial light and sunlight in laboratory and pilot-plant experiments. This study is potentially applicable to waste treatment.⁵

The bacterium *Citrobacter sp.* strain VA53 isolated from the gut of a lower termite, *Coptotermes formosanus*, can also grow and metabolize vanillin anaerobically.⁶

Precautions and Disclaimer

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

Preparation Instructions

This product is soluble in ethanol (50 mg/ml), yielding a clear, colorless solution. It is also soluble in water (10 mg/ml) and glycerol (50 mg/ml) at room temperature. Vanillin is freely soluble in chloroform, ether, carbon disulfide, glacial acetic acid, and pyridine. It is also soluble in oils and aqueous solutions of alkali hydroxides.¹

References

1. The Merck Index, 12th ed., Entry# 10069.
2. Stewart, R., A kinetic study of alkaline scission of 4-hydroxy-3-methoxy-β-nitrostyrene. *J. Am. Chem. Soc.*, **74**, 4531-4533 (1952).
3. Data for Biochemical Research, 3rd ed., Dawson, R. M. C., et al., Oxford University Press (New York, NY: 1986), pp. 463, 468, 476, 484, 496.
4. Liu, G. A., and Zheng, R. L., Protection against damaged DNA in the single cell by polyphenols. *Pharmazie.*, **57(12)**, 852-854 (2002).
5. Gernjak, W., et al., Photo-Fenton treatment of water containing natural phenolic pollutants. *Chemosphere.*, **50(1)**, 71-78 (2003).
6. Harazono, K., Isolation and characterization of aromatics-degrading microorganisms from the gut of the lower termite *Coptotermes formosanus*. *Biosci. Biotechnol. Biochem.*, **67(4)**, 889-892 (2003).

HLD/RXR 11/03

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