

Ethyl Vanillin

1 Nonproprietary Names

USPNF: Ethyl vanillin

2 Synonyms

Bourbonal; ethylprotal; ethylprotocatechuic aldehyde; 4-hydroxy-3-ethoxybenzaldehyde; *Rhodirome*; vanillal.

3 Chemical Name and CAS Registry Number

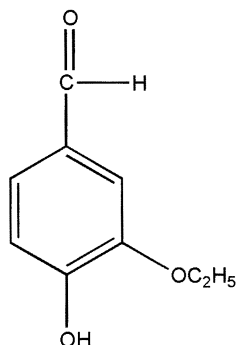
3-Ethoxy-4-hydroxybenzaldehyde [121-32-4]

4 Empirical Formula Molecular Weight

C₉H₁₀O₃

166.18

5 Structural Formula



6 Functional Category

Flavoring agent.

7 Applications in Pharmaceutical Formulation or Technology

Ethyl vanillin is used as an alternative to vanillin, i.e., as a flavoring agent in foods, beverages, confectionery, and pharmaceuticals. It is also used in perfumery.

Ethyl vanillin possesses a flavor and odor approximately three times as intense as vanillin, hence the quantity of material necessary to produce an equivalent vanilla flavor may be reduced, causing less discoloration to a formulation and potential savings in material costs. However, exceeding certain concentration limits may impart an unpleasant, slightly bitter taste to a product due to the intensity of the ethyl vanillin flavor. *See* Table I.

Table I: Uses of ethyl vanillin.

Use	Concentration (%)
Foods and confectionery	0.002–0.025
Oral syrups	0.01

8 Description

White or slightly yellowish crystals with a characteristic intense vanilla odor and flavor.

9 Pharmacopeial Specifications

See Table II.

Table II: Pharmacopeial specifications for ethyl vanillin.

Test	USPNF 20
Identification	+
Melting range	76.0–78.0 °C
Loss on drying	≤ 1.0%
Residue on ignition	≤ 0.1%
Organic volatile impurities	+
Assay (dried basis)	98.0–101.0%

10 Typical Properties

Boiling point: 285 °C

Density (bulk): 1.05 g/cm³

Flash point: 127 °C

Melting point: 76–78 °C

Solubility: *see* Table III.

Table III: Solubility of ethyl vanillin.

Solvent	Solubility at 20 °C unless otherwise stated
Alkaline hydroxide solutions	Freely soluble
Chloroform	Freely soluble
Ethanol (95%)	1 in 2
Ether	Freely soluble
Glycerin	Soluble
Propylene glycol	Soluble
Water	1 in 250 1 in 100 at 50 °C

11 Stability and Storage Conditions

Store in a well-closed container, protected from light, in a cool, dry place. *See* Vanillin for further information.

12 Incompatibilities

Ethyl vanillin is unstable in contact with iron or steel forming a red-colored, flavorless compound. In aqueous media with neomycin sulfate or succinylsulfathiazole, tablets of ethyl vanillin produced a yellow color.⁽¹⁾ *See* Vanillin for other potential incompatibilities.

13 Method of Manufacture

Unlike vanillin, ethyl vanillin does not occur naturally. It may be prepared synthetically by the same methods as vanillin,

using guethol instead of guaiacol as a starting material; *see* Vanillin.

14 Safety

Ethyl vanillin is generally regarded as an essentially nontoxic and nonirritant material. However, cross-sensitization with other structurally similar molecules may occur; *see* Vanillin.

The WHO has allocated an acceptable daily intake for ethyl vanillin of up to 3 mg/kg body-weight.⁽²⁾

LD₅₀ (guinea pig, IP): 1.14 g/kg^(3,4)

LD₅₀ (mouse, IP): 0.75 g/kg

LD₅₀ (rabbit, oral): 3 g/kg

LD₅₀ (rabbit, SC): 2.5 g/kg

LD₅₀ (rat, oral): 1.59 g/kg

LD₅₀ (rat, SC): 3.5–4.0 g/kg

15 Handling Precautions

Observe normal precautions appropriate to the circumstances and quantity of material handled. Eye protection is recommended. Heavy airborne concentrations of dust may present an explosion hazard.

16 Regulatory Status

GRAS listed. Included in the FDA Inactive Ingredients Guide (oral capsules, suspensions, and syrups). Included in nonparenteral medicines licensed in the UK.

17 Related Substances

Vanillin.

18 Comments

Ethyl vanillin can be distinguished analytically from vanillin by the yellow color developed in the presence of concentrated sulfuric acid. The EINECS number for ethyl vanillin is 204-464-7.

19 Specific References

- 1 Onur E, Yalcindag ON. Double incompatibility of ethyl vanillin (vanillal) in compressed tablets [in French]. *Bull Soc Pharm Bordeaux* 1970; 109(2): 49–51.
- 2 FAO/WHO. Evaluation of certain food additives and contaminants. Forty-fourth report of the joint FAO/WHO expert committee on food additives. *World Health Organ Tech Rep Ser* 1995; No. 859.
- 3 Sweet DV, ed. *Registry of Toxic Effects of Chemical Substances*. Cincinnati: US Department of Health, 1987, 721.
- 4 Lewis RJ, ed. *Sax's Dangerous Properties of Industrial Materials*, 10th edn. New York: Wiley, 2000, 1737–1738.

20 General References

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21 Author

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22 Date of Revision

29 April 2002.