

Ethyl Maltol

1 Nonproprietary Names

None adopted.

2 Synonyms

2-Ethyl pyromeconic acid; 3-hydroxy-2-ethyl-4-pyrone; *Veltol Plus*.

3 Chemical Name and CAS Registry Number

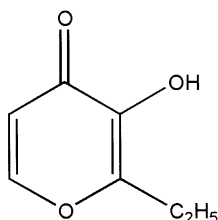
2-Ethyl-3-hydroxy-4*H*-pyran-4-one [4940-11-8]

4 Empirical Formula Molecular Weight

C₇H₈O₃

140.14

5 Structural Formula



6 Functional Category

Flavor enhancer; flavoring agent.

7 Applications in Pharmaceutical Formulation or Technology

Ethyl maltol is used in pharmaceutical formulations and food products as a flavoring agent or flavor enhancer in applications similar to maltol. It has a flavor and odor 4–6 times as intense as maltol. Ethyl maltol is used in oral syrups at concentrations of about 0.004% w/v and also at low levels in perfumery.

8 Description

White crystalline solid with characteristic, very sweet, caramel-like odor and taste. In dilute solution it possesses a sweet, fruitlike flavor and odor.

9 Pharmacopeial Specifications

See Section 19.

10 Typical Properties

Melting point: 89–93 °C

Solubility: see Table I.

Table I: Solubility of ethyl maltol.

Solvent	Solubility at 20 °C
Chloroform	1 in 5
Ethanol (95%)	1 in 10
Glycerin	1 in 500
Propan-2-ol	1 in 11
Propylene glycol	1 in 17
Water	1 in 55

11 Stability and Storage Conditions

Solutions may be stored in glass or plastic containers. The bulk material should be stored in a well-closed container, protected from light, in a cool, dry place.

12 Incompatibilities

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13 Method of Manufacture

Unlike maltol, ethyl maltol does not occur naturally. It may be prepared by treating α -ethylfurfuryl alcohol with a halogen to produce 4-halo-6-hydroxy-2-ethyl-2*H*-pyran-3(6*H*)-one, which is converted to ethyl maltol by hydrolysis.

14 Safety

In animal feeding studies, ethyl maltol has been shown to be well tolerated with no adverse toxic, reproductive, or embryogenic effects. It has been reported that while the acute toxicity of ethyl maltol, in animal studies, is slightly greater than maltol; with repeated dosing the opposite is true.⁽¹⁾ Although an acceptable daily intake for ethyl maltol has not been set the WHO has set an acceptable daily intake for maltol at up to 1 mg/kg body-weight.⁽²⁾

LD₅₀ (chicken, oral): 1.27 g/kg⁽³⁾

LD₅₀ (rat, oral): 1.15 g/kg

LD₅₀ (mouse, oral): 0.78 g/kg

LD₅₀ (mouse, SC): 0.91 g/kg

15 Handling Precautions

Observe normal precautions appropriate to the circumstances and quantity of material handled. Ethyl maltol should be used in a well-ventilated environment. Dust may be irritant and eye protection and gloves are recommended.

16 Regulatory Status

GRAS listed. Accepted for use as a food additive in the UK. Included in the FDA Inactive Ingredients Guide (oral syrup).

17 Related Substances

Maltol.

18 Comments

See Maltol for further information.

Although not included in any pharmacopeias, a specification for ethyl maltol is contained in the Food Chemicals Codex (FCC), see Table II.⁽⁴⁾

Table II: Food Chemicals Codex specifications for ethyl maltol.

Test	FCC IV
Identification	+
Heavy metals (as lead)	≤ 0.002%
Lead	≤ 10 ppm
Residue on ignition	≤ 0.2%
Water	≤ 0.5%
Assay (dried basis)	≥ 99.0%

19 Specific References

- 1 Gralla EJ, Stebbins RB, Coleman GL, Delahunt CS. Toxicity studies with ethyl maltol. *Toxicol Appl Pharmacol* 1969; 15: 604–613.
- 2 FAO/WHO. Evaluation of certain food additives. Twenty-fifth report of the joint FAO/WHO expert committee on food additives. *World Health Organ Tech Rep Ser* 1981; No. 669.
- 3 Lewis RJ, ed. *Sax's Dangerous Properties of Industrial Materials*, 10th edn. New York: Wiley, 2000.
- 4 *Food Chemicals Codex*, 4th edn. Washington, DC: National Academy Press, 1996: 138.

20 General References

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21 Author

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22 Date of Revision

6 March 2002.