Maltol

1 Nonproprietary Names

USP–NF: Maltol

2 Synonyms

Corps praline; 3-hydroxy-2-methyl-(1,4-pyran); 3-hydroxy-2-methyl-4-pyrone; larixinic acid; larixix acid; 2-methyl-3-hydroxy-4-pyrone; 2-methyl pyromeconic acid; *Palatone*; *Talmon*; *Veltol*.

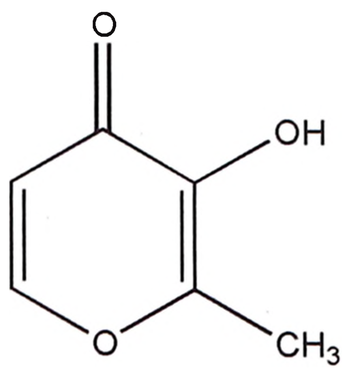
3 Chemical Name and CAS Registry Number

3-Hydroxy-2-methyl-4 *H* -pyran-4-one [118-71-8]

4 Empirical Formula and Molecular Weight

$C_6H_6O_3$ 126.11

5 Structural Formula



6 Functional Category

Flavor enhancer; flavoring agent.

7 Applications in Pharmaceutical Formulation or Technology

Maltol is used in pharmaceutical formulations and food products as a flavoring agent or flavor enhancer. In foods, it is used at concentrations up to 30 ppm, particularly with fruit flavorings, although it is also used to impart a freshly baked odor and flavor to bread and cakes. When used at concentrations of 5–75 ppm, maltol potentiates the sweetness of a food product, permitting a reduction in sugar content of up to 15% while maintaining the same level of sweetness. Maltol is also used at low levels in perfumery.

8 Description

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

9 Pharmacopeial Specifications

See Table I.

Table I: Pharmacopeial specifications for maltol.

Test	USP 40–NF 35 S1
Identification	+
Melting range	160–164°C
Water	≤0.5%
Residue on ignition	≤0.2%
Lead	≤10 ppm
Heavy metals	≤20 ppm
Assay (anhydrous basis)	≥99.0%

10 Typical Properties

Acidity/alkalinity pH = 5.3 (0.5% w/v aqueous solution)
Melting point 162–164°C (begins to sublime at 93°C)
Solubility *see* Table II.

Table II: Solubility of maltol.

Solvent	Solubility at 20°C
Chloroform	Freely soluble
Diethyl ether	Sparingly soluble
Ethanol (95%)	1 in 21
Glycerin	1 in 80
Propan-2-ol	1 in 53
Propylene glycol	1 in 28
Water	1 in 82

Spectroscopy

IR spectrum *see* Figure 1.
NIR spectrum *see* Figure 2.
Raman spectrum *see* Figure 3.

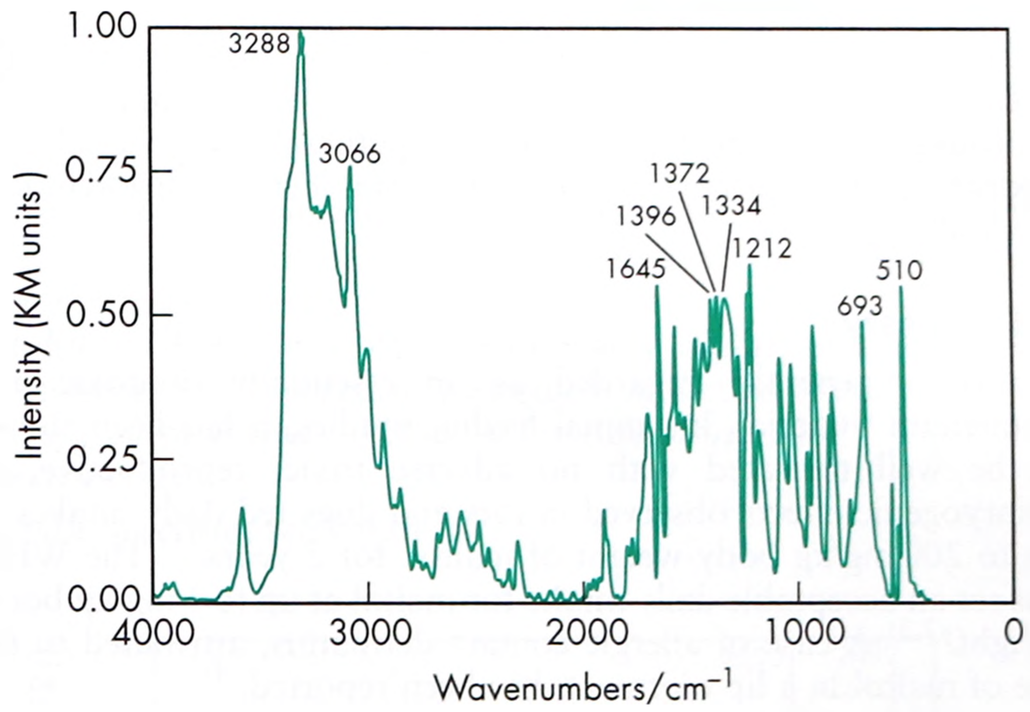


Figure 1: Infrared spectrum of maltol measured by diffuse reflectance. Adapted with permission of Informa Healthcare.

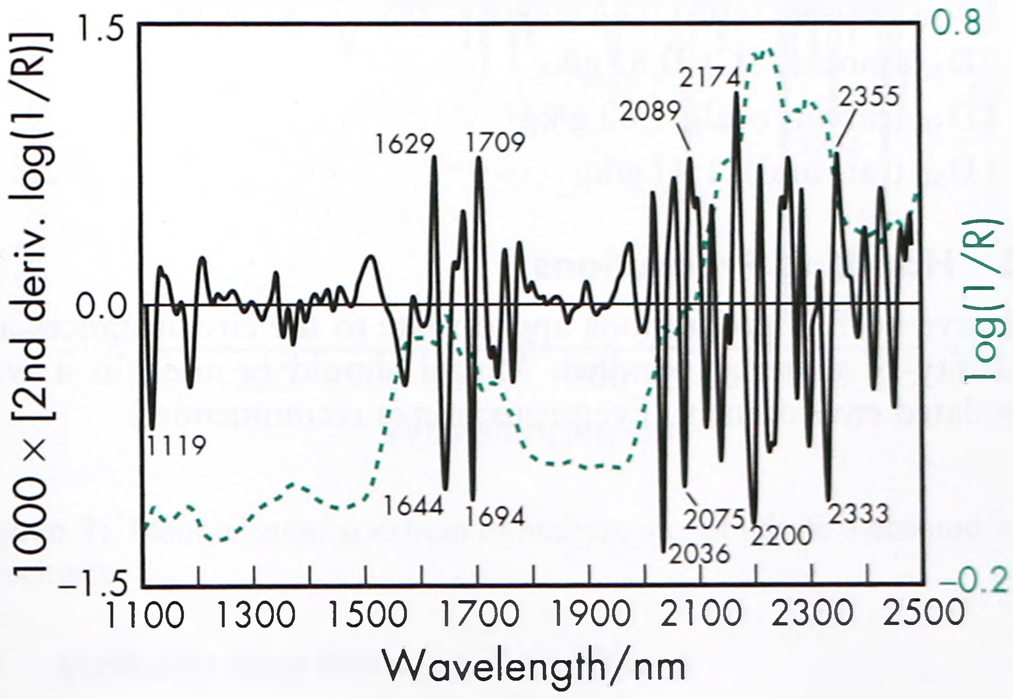


Figure 2: Near-infrared spectrum of maltol measured by reflectance.