5 Saha S, Shahiwala AF. Multifunctional coprocessed excipients for improved tabletting performance. *Expert Opin Drug Deliv* 2009; 6(2): 197–208.
6 Bolhuis GK, Armstrong NA. Excipients for direct compaction – an update. *Pharm Dev Tech* 2006; **11**(1): 111–124.
7 Jivraj M, *et al.* An overview of the different excipients useful for the direct compression of tablets. *PSTT* 2000; 3(2): 58–63.
8 SPI Pharma Inc. Product bulletin: *Compressol SM, Co-processed polyol*, November 2010.
9 SPI Pharma Inc. Material safety data sheet: *Compressol SM*, version 2.0, 1 May 2015.

20 General References

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21 Author

JT Heinämäki.

22 Date of Revision

26 April 2017.

D-Mannose

1 Nonproprietary Names

None adopted.

2 Synonyms

Carubinose; dextra mannose; D-mannopyranose; *MannoTab*; seminose.

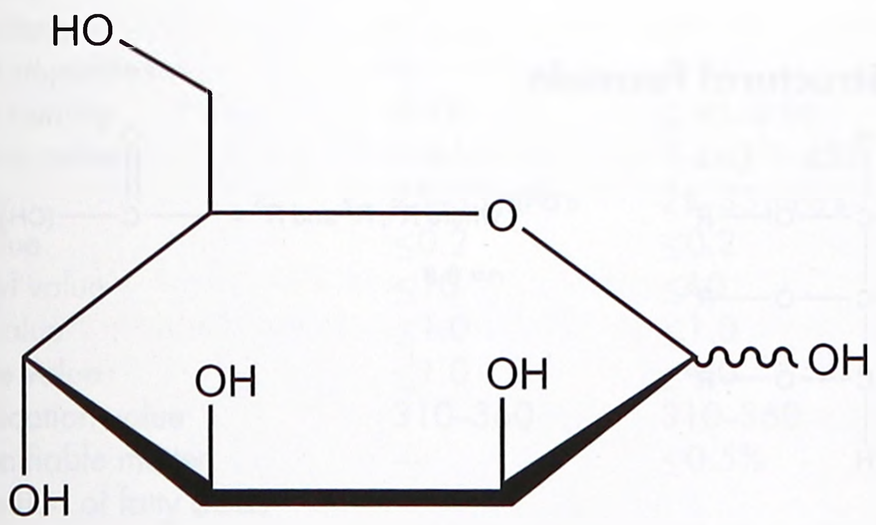
3 Chemical Name and CAS Registry Number

(3*S*,4*S*,5*S*,6*R*)-6-(Hydroxymethyl)oxane-2,3,4,5-tetrol [3458-28-4]

4 Empirical Formula and Molecular Weight

$C_6H_{12}O_6$ 180.16

5 Structural Formula



6 Functional Category

Antioxidant; sweetening agent.

7 Applications in Pharmaceutical Formulation or Technology

D-Mannose is used as a sweetening agent in oral pharmaceutical products. A directly compressible grade of D-mannose is used as an antioxidant in dietary applications.[1]

8 Description

D-Mannose is a colorless or white crystalline powder with a sweet taste but bitter aftertaste. The ambiguity of taste perception of D-mannose has been traced to actual differences in taste between the α and β forms.[2]

9 Pharmacopeial Specifications

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10 Typical Properties

Density 1.54 g/cm^3
Dissociation constant $pK_a = 11.98$
Melting point 132–140°C (with decomposition); 133°C (α-form)
Solubility *see* Table I.

Table I: Solubility of D-mannose.

Solvent	Solubility at 20°C unless otherwise stated
Ethanol	1 in 250
Methanol	1 in 120
Pyridine	1 in 3.5
Water	1 in 0.4

Specific rotation $[\alpha]_D^{20}$ +13.7 to +14.2° (20% w/v in water containing approx. 0.05% w/v NH_3).

11 Stability and Storage Conditions

D-Mannose is stable in the dry state and in aqueous solutions. It can be fermented by yeast. Store in tightly closed containers in a cool, dry place.

12 Incompatibilities

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13 Method of Manufacture

D-Mannose is prepared from glucose in the Lobry-de Bruyn-van Ekenstein transformation. It can also be prepared by the oxidation of mannitol.

D-Mannose can also be manufactured from wood-based or other biomass hydrolysates using an aqueous chromatographic separation process.[1]

14 Safety

D-Mannose is used in oral preparations. The majority of ingested D-mannose is excreted unconverted into the urine within 30–60