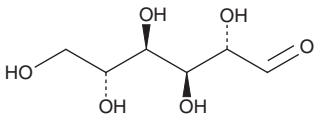
PRODUCT INFORMATION

D-Mannose

Item No. 27388

CAS Registry No.:	3458-28-4
Synonyms:	Carubinose, (+)-Mannose, NSC 26247
MF:	$C_6H_{12}O_6$
FW:	180.2
Purity:	≥95%
Supplied as:	A crystalline solid
Storage:	-20°C
Stability:	≥2 years
Item Origin:	Semi-synthetic



Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Laboratory Procedures

D-Mannose is supplied as a crystalline solid. A stock solution may be made by dissolving the D-mannose in the solvent of choice, which should be purged with an inert gas. D-Mannose is soluble in organic solvents such as DMSO and dimethyl formamide. The solubility of D-mannose in these solvents is approximately 20 and 10 mg/ml, respectively.

Further dilutions of the stock solution into aqueous buffers or isotonic saline should be made prior to performing biological experiments. Ensure that the residual amount of organic solvent is insignificant, since organic solvents may have physiological effects at low concentrations. Organic solvent-free aqueous solutions of D-mannose can be prepared by directly dissolving the crystalline solid in aqueous buffers. The solubility of D-mannose in PBS, pH 7.2, is approximately 10 mg/ml. We do not recommend storing the aqueous solution for more than one day.

Description

D-Mannose is an aldohexose monosaccharide and an epimer of glucose. D-Mannose is found in animals, microbes, and plants, can be used as an energy source by conversion to glucose, and can also be produced from glucose.[1] It is converted *via* hexokinase to mannose-6-phosphate and then to intermediates that are incorporated into proteins *via* N-linked glycosylation. It decreases T cell proliferation and increases FoxP3$^+$ T regulatory cells *in vitro* and prevents diabetes in non-obese diabetic (NOD) mice, a model of autoimmune diabetes, when administered at a dose of 1.1 M in the drinking water.[2] D-Mannose administration during gestation at a dose of 9 mg/ml in the drinking water rescues the embryonic lethal phenotype and prevents deficits in glycosylation in *Pmm2*$^{R137H/F118L}$ mice, a transgenic model of the congenital glycosylation disorder (CDG) PMM2-CDG, which is characterized by phosphomannomutase 2 (PMM2) gene mutations.[3] Levels of D-mannose are reduced in the serum of patients with PMM2-CDG.[4] Formulations containing D-mannose have been used in the treatment of mannose phosphate isomerase CDG (MPI-CDG).

References

1. Sharma, V., Ichikawa, M., and Freeze, H.H. Mannose metabolism: More than meets the eye. *Biochim. Biophys. Res. Commun.* **453(2)**, 220-228 (2014).
2. Zhang, D., Chia, C., Jiao, X., *et al.* D-mannose induces regulatory T cells and suppresses immunopathology. *Nat. Med.* **23(9)**, 1036-1045 (2017).
3. Schneider, A., Theil, C., Rindermann, J. *et al.* Successful prenatal mannose treatment for congenital disorder of glycosylation-Ia in mice. *Nat. Med.* **18(1)**, 71-73 (2011).
4. Panneerselvam, K., Etchison, J.R., Skovby, F., *et al.* Abnormal metabolism of mannose in families with carbohydrate-deficient glycoprotein syndrome type 1. *Biochem. Mol. Med.* **61(2)**, 161-167 (1997).

CAYMAN CHEMICAL
1180 EAST ELLSWORTH RD
ANN ARBOR, MI 48108 · USA
PHONE: [800] 364-9897
[734] 971-3335
FAX: [734] 971-3640
CUSTSERV@CAYMANCHEM.COM
WWW.**CAYMANCHEM**.COM