



Product Information

Heparin Low molecular weight: sodium salt from Porcine intestinal mucosa

Product Number **H 2149**
Store at Room Temperature

Product Description

CAS Number: 9041-08-1

Heparin is a polymer classified as a mucopolysaccharide or a glycosaminoglycan. It is biosynthesized and stored in mast cells of various mammalian tissues, particularly liver, lung and mucosa. Commercial heparin is chiefly isolated from beef lung or pork intestinal mucosa.¹

This product has been traditionally used as an anticoagulant. Heparin binds to antithrombin III, a naturally occurring plasma protease inhibitor, accelerating significantly the rate at which antithrombin III (AT-III) inhibits coagulation proteases (Factor X_a and thrombin).^{2,3,4}

In addition, this product has been shown to stabilize trypsin as an enzymatically active tetramer.⁵

It is unlikely that heparin is cell membrane permeable, including that of the brain.⁶ Heparin crosses cell membranes poorly, because of its polarity and large molecular size. It is not absorbed from the gastrointestinal and sublingual sites. Passage along the placenta and into the maternal milk is also hindered.

This product is standard heparin that has been further processed by enzymatic digestion. EDTA is used in the processing of this product. The low MW heparin product goes through several alcohol precipitations, so the EDTA should be removed. However, the product has not been tested for the absence of residual EDTA.

Precautions and Disclaimer

For Laboratory Use Only. Not for drug, household or other uses.

Preparation Instructions

This product is soluble in water (50 mg/ml).

Storage/Stability

Heparin is a polysaccharide, which has excellent aqueous solution stability (up to 2 years at 2-8 °C) provided the solutions have been filtered through a 0.2 µm membrane. Alternatively, 0.06-1% benzyl alcohol may be added to solutions to prevent bacterial growth. Any small traces of contaminating organisms in the solution will break down the heparin in order to use its sugars for nutrients, and the stability of non-sterile solutions is very poor. Heparin solutions should not be autoclaved, because additional cross-linking of the sugars may occur at high temperatures. There is no need to freeze solutions of heparin; in fact, solutions of any polysaccharide of high molecular weight should not be frozen.

However, literature indicates solutions in ammonium acetate buffer, pH 5.8, can be aliquoted and stored frozen at -80 °C for about one month. No information is available regarding solution stability of frozen solutions in PBS.

References

1. The Merck Index, 12th Ed., Entry# 4685.
2. Björk, I. and Lindahl, U., Mechanism of the anticoagulant action of heparin. *Molecular Cellular Biochemistry*, **48(3)**, 161-168 (1982).
3. Prevention of venous thromboembolism in surgical patients by low-dose heparin: prepared by the Council on Thrombosis of the American Heart Association. *Circulation*, **55**, 423-426A (1977).
4. Jordan, R., et al., Fractionation of low molecular weight heparin species and their interaction with antithrombin. *J. Biol. Chem.*, **254**, 2902-2913 (1979).

5. Schwartz, L. B., and Bradford, T. R., Regulation of tryptase from human lung mast cells by heparin. Stabilization of the active tetramer. J. Biol. Chem., **261**, 7372-7379 (1986).
6. The Pharmacological Basis of Therapeutics, 7th Ed., Gilman, A. G. et al., Eds., Macmillan (New York, NY: 1985), p. 1341.

CMH 5/03

Sigma brand products are sold through Sigma-Aldrich, Inc.

Sigma-Aldrich, Inc. warrants that its products conform to the information contained in this and other Sigma-Aldrich publications. Purchaser must determine the suitability of the product(s) for their particular use. Additional terms and conditions may apply. Please see reverse side of the invoice or packing slip.