Heparinase I Research Grade

Part No	50-010	(0.5 IU/vial)
	50-010-001	(0.1 IU/vial)
	50-010-002	(Bulk)

Product Information

Synonyms	Heparinase; heparin lyase; heparin eliminase
Source	*Flavobacterium heparinum* (Recombinant)
EC Number	4.2.2.7
CAS Number	9025-39-2
Purity	≥ 95 % by reverse-phase HPLC analysis
Product Format	Heparinase I is presented in a phosphate buffered saline pH 7.0 containing a disaccharide as cryoprotectant. Supplied as frozen solution. No bovine serum albumin (BSA), glycerol or preservatives added.

Package Details & Catalytic Concentration

Part No	*Volume*	*Activity/vial*	*Catalytic conc.*
50-010	> 50 µL	≥ 0.5 IU	≥ 10 IU/mL
50-010-001	> 10 µL	≥ 0.1 IU	≥ 10 IU/mL
50-010-002*	Bulk	> 0.5 IU	≥ 10 IU/mL

** can be aliquoted from 50 µL to up to 900 mL per container as per customer's request*

Storage and Shipping Information

Storage Temperature	-70 °C
Transport Condition	Product shipped on dry ice

Catalytic Reaction

The enzyme cleaves selectively (*via* an elimination mechanism) highly sulfated polysaccharide chains containing 1-4 linkages between hexosamines & O-sulfated iduronic acid residues. The reaction yields oligosaccharide products (mainly disaccharides) containing unsaturated uronic acids, which can be detected by UV spectroscopy at 232 nm. The enzyme also cleaves the antithrombin III binding pentasaccharide domain in the heparin molecule.

Substrate Specificity

Heparin; heparan sulfate (specific activity with heparin is approximately **three** times higher than with heparan sulfate.)

Properties

- O-glycosylated at Ser-39
- Isoelectric point: 9.3 – 9.5
- Molecular weight: 42,508 Da
- Calcium ion is a cofactor and an activator

Activity

- One International Unit (IU) is defined as the amount of enzyme that will liberate 1.0 µmole unsaturated oligosaccharides from porcine mucosal heparin per minute at 30°C & pH 7.0. (Activity depends on the assay temperature, the buffer, the source & the type of Heparin used).
- One Unit (U) is also defined in other preparation as 1 U that liberates 0.1 µmol of unsaturated uronic acid per hour at 25°C and pH 7.5; ***1 IU is equivalent to 600 U.***

Activity Assay Parameters	*Range*	*Optimum*
pH	4.0 – 9.0	7.0 ± 0.1
Temperature	20 – 37°C	30 ± 0.5°C
Calcium Concentration	1.0 – 5.0 mM	2.5 mM

Intended Use, Reference & Precaution

- These products are for ***in vitro*** **R&D use only** & not for therapeutic or other uses.
- Refer to the respective lot-specific certificate of analysis for the actual activity and the shelf life.
- Once thawed, aliquot as needed & freeze at -70°C to avoid multiple freeze-thaw cycles.

Applications

- *In vitro* neutralization of heparin in blood & plasma samples before analysis.
- Preparation of disaccharides of heparin & the preparation of oligosaccharide libraries.
- Measurement of heparin in blood & plasma using the *in vitro* thromboelastography (TEG) tests.
- Coagulation & anticoagulation efficacy studies.
- Production of low- & ultra-low molecular weight heparins (LMWH & ULMWH) from unfractionated heparin & immobilization of heparinase I for such use.
- In-process, quality control, & compendial testing of heparins, heparan sulfate (HS), heparin- & HS-derived products.
- Structural analysis, mass spectral analysis & characterization of heparin, heparan sulfate (HS), low molecular weight heparins, & synthetic heparin pentasaccharides & oligosaccharides.
- Depolymerization of heparin, HS & chemically modified heparins, & molecular weight profiling of heparins.
- Quantification of contaminants in heparin such as over-sulfated chondroitin sulfate & persulfonated heparin & quantification of process-related impurities.
- Glycobiology & cancer biology research.
- Identification of the biological properties of HS that depend on the integrity of the S-domains & determination of the spacing between S-domains.
- *In vitro* host-pathogen interactions in viral infections, virus-adhesion inhibition studies, virus-plaque inhibition assays, cell culture experiments, etc.
- *In vivo* inhibition studies of neovascularization & proliferation of capillary endothelial cells.
- Circumventing the inhibitory effects of heparin in PCR, RT-PCR, real-time RT-qPCR reaction & Western Blot.
- *In vitro* histochemistry, immunohistochemistry, immunocytochemistry & flow cytometry, etc.

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