For life science research only.
Not for use in diagnostic procedures.

Sorbitol Dehydrogenase (SDH)

Polyol dehydrogenase from sheep liver

L-Iditol: NAD 5'-oxidoreductase

Version: 07

Content Version: November 2021

Cat. No. 10 109 339 001 10 mg
60 mg lyophilizate

Store the product at +2 to +8°C.

1. General Information

1.1. Contents

Vial / bottle	Label	Function / description	Content
1	Sorbitol Dehydrogenase	60 mg lyophilizate contains 10 mg enzyme protein and 50 mg maltose.	1 vial, 10 mg

1.2. Storage and Stability

Storage Conditions (Product)

When stored at +2 to +8°C, the product is stable through the expiry date printed on the label.

Vial / bottle	Label	Storage
1	Sorbitol Dehydrogenase	Store at +2 to +8°C. ⚠ ***Store dry.***

Storage Conditions (Working Solution)

Store an aqueous solution several weeks at +2 to +8°C.

1.3. Application

Sorbitol Dehydrogenase reduces L-iditol to L-sorbose.
- Acts on D-glucitol and other closely related sugar alcohols.
- Allows the reduction of ketones to polyols (see aldolases for the synthesis of ketoses).

2. How to Use this Product

2.1. Parameters

Activator

The oxidation or reduction reactions are fastest in Tris or triethanolamine buffer.

Contaminants

Contaminants	Value [%]
ADH	<0.01
GlDH	<0.02
Glucose dehydrogenase	<0.02
LDH	<0.05
MDH	<0.05

EC-Number

EC 1.1.1.14

Inhibition

4-Chloromercuribenzoate (0.1 mM), cysteine (2 mM), monoiodoacetate, glutathione, cyanide, EDTA and other chelators, borate, and metal ions, such as Ag^{+}, Hg^{2+}, and Pb^{2+}.
Not inhibited by heparin.

Molecular Weight

115 kDa

pH Optimum

Oxidation of D-sorbitol: pH 9.0 to 9.5
Reduction of fructose: pH 7.4 to 7.6
The reduction of D-fructose is favored. Alkaline pH shifts the equilibrium in favor of sorbitol oxidation.

Specific Activity

Approximately 40 U/mg enzyme protein at +25°C with D-fructose as substrate.

Specificity

Substrate specificity and K_m

Sorbitol Dehydrogenase will oxidize the following substrates:

Substrate	Oxidized to	Relative rate
D-sorbitol (K_m: 0.7 mM)	Fructose	1.00
L-iditiol	L-sorbose	0.96
Xylitol	D-xylulose	0.85
Ribitol	D-ribulose	0.49
Allitol	Allulose	0.45

Sorbitol Dehydrogenase also catalyzes the reverse (reduction) reactions of each of the substrates. The K_m for fructose is 250 to 300 mM. Sorbitol Dehydrogenase is specific for NAD(H); it will utilize NADP(H) only at a 10- to 100-fold reduced rate.

Substrates not oxidized

Erythritol, D- or L-arabitol, D-iditol, D-mannitol or inositol.

Substrates not reduced

D-tagatose, D-mannoheptulose, D-glucose, DL-glyceraldehyde, pyruvate, 2-oxolutarate, or acetaldehyde.

Unit Definition

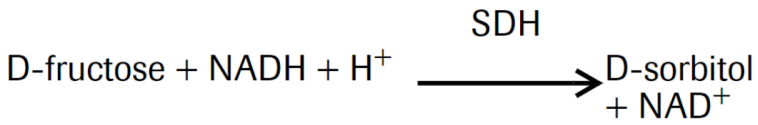
One unit Sorbitol Dehydrogenase will reduce 1 µmol of D-fructose in one minute at +25°C and pH 7.6 (triethanolamine buffer; 150 mM fructose [nonsaturating concentration]). The control assay consumes 1 µmol of NADH per µmol of D-sorbitol formed.

3. Additional Information on this Product

3.1. Test Principle

D-sorbitol and xylitol are frequently used as sugar substitutes for diabetics. Sorbitol is a moistener and softener in many foods. The amount of fructose required to saturate SDH is approximately 400 mM, depending on the assay buffer. For instance, the saturating concentration of fructose is higher in Tris buffer than in triethanolamine.

Control assay



The oxidation of xylitol to xylulose, as well as the oxidation of D-sorbitol is favored by alkaline pH. At pH 8.6, in triethanolamine buffer with excess NADH, SDH will quantitatively oxidize xylitol.
In the colorimetric assay of sorbitol and xylitol, high concentrations of reducing substances (≥5 µg/assay) such as ascorbic acid (in fruit juice) or SO_2 (in jam) interfere. A procedure for removing these reducing substances (with H_2O_2 and alkali) can be found in food analysis literature.

3.2. Quality Control

For lot-specific certificates of analysis, see section, **Contact and Support**.

4. Supplementary Information

4.1. Conventions

To make information consistent and easier to read, the following text conventions and symbols are used in this document to highlight important information:

Text convention and symbols	
Information Note: Additional information about the current topic or procedure.	
Important Note: Information critical to the success of the current procedure or use of the product.	
① ② ③ etc.	Stages in a process that usually occur in the order listed.
❶ ❷ ❸ etc.	Steps in a procedure that must be performed in the order listed.
* (Asterisk)	The Asterisk denotes a product available from Roche Diagnostics.

4.2. Changes to previous version

Layout changes.
Editorial changes.

4.3. Trademarks

All product names and trademarks are the property of their respective owners.

4.4. License Disclaimer

For patent license limitations for individual products please refer to:
List of biochemical reagent products and select the corresponding product catalog.

4.5. Regulatory Disclaimer

For life science research only. Not for use in diagnostic procedures.

4.6. Safety Data Sheet

Please follow the instructions in the Safety Data Sheet (SDS).

4.7. Contact and Support

To ask questions, solve problems, suggest enhancements or report new applications, please visit our **Online Technical Support Site**.

To call, write, fax, or email us, visit **sigma-aldrich.com**, and select your home country. Country-specific contact information will be displayed

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