BIOCATALYSTS | A BRAIN Group company

Mannitol dehydrogenase

M093P

Features/Benefits

- In vitro diagnostic enzyme
- Mannitol detection in urine/body fluids
- Enzyme linked spectrophotometric
- Low cost, simple and rapid

Serious gastric disorders often result in an inability to absorb nutrients. Coeliac disease is one such instance where an immune response to proteins causes alterations in the intestinal lining resulting in reduced ability to absorb nutrients. This problem, if not diagnosed and treated, results in malnutrition and its associated diseases. Once diagnosed, treatment and management result in good recovery. Enzyme based test methodologies are ideal for diagnostic applications and are easy to carry out, sensitive and reliable. Mannitol Dehydrogenase (ManDH) is active against mannitol and is therefore useful for its determination. When present in the urine, (and relative to other components) mannitol is a good indicator of gastric disorders. Other diagnostic options such as biopsy are not so patient friendly.

Specification

Minimum Activity	1 Mannitol Dehydrogenase (u/mg)
Specific Activity	>5.0 u/mg protein
Unit Definition	1 unit covers 1µM of NAD+ per minute at 37°C and pH 10.5 in presence of mannitol
Biological Source	*Pseudomonas sp.*
Form	Lyophilised off-white powder
Cross Reactivity	< 2% with xylitol and glycerol
K_M	1.15mM
IUB No & Type	1.1.1.67 / D-Mannitol: NAD 2-oxido-reductase
Optimum pH Range	10.0 - 11.0
Optimum Temperature Range	35 - 50°C

Application & Dose

Intestinal permeability is a good indicator of many gastric disorders. The test involves consumption of a dual sugar drink containing mannitol and lactulose. The urine is collected for 5 hours and the level of sugars determined enzymatically. The sugar ratio gives a good indicator of gastric disorder. ManDH converts mannitol to fructose in the presence of NAD+ as an electron acceptor. Electrons from the reduced NAD+ i.e. NADH are transferred to a substrate such as Iodonitrotetrazolium hydrochloride (INT) via the action of the enzyme diaphorase. This process results in the formation of the red formazan dye which can be quantified spectrophotometrically. A suitable sample e.g. the prepared urine is incubated with ManDH, NAD, Diaphorase and INT and the result determined by spectrophotometric measurement. This might use an instrument such as a microplate reader to minimise the required reagent volumes and increase throughput. The result will be obtained by reference to a set of standards. The exact levels of enzyme, buffering reagents and conditions to be used in such a kit to obtain the desired measuring range and reliability will have to be determined in studies. Dithiothreitol may be required to stabilise the enzyme. The temperature and pH optimum indicated for this product are conditions where the product gives maximum activity as measured using the Biocatalysts' assay procedure. Further information on gastric disorders can be found in the references cited below.

(1) Lunn P.G., Northrop C.A. and Northrop A.J.,1989, Clinica. Chimica. Acta., 183, p163-170. (2)
(2) Strobel S., Brydon W., and Ferguson A., 1984, Gut. 25. 11, pp1241-1246.

Health & Safety

Always read the Material Safety Datasheet (MSDS) before use and retain. If you are in any doubt about recommended product handling and safety, please contact Biocatalysts before use. Generally, when using enzymes avoid contact with the skin and eyes and do not breathe dusts or aerosols containing them.

GM Status

This product does not contain GMMs or genetically modified material.

Food Status

This product has not been produced as a food grade product but has been manufactured under ISO 9001 accreditation.

Quality

1. Good Manufacturing Practice (GMP) - The Company's integrated management system encompasses Total Quality, Health and Safety, Food Safety and GMP.
2. Biocatalysts Ltd is certified to ISO9001, ISO14001, ISO45001 and FSSC 22000.

Availability

Available in 1,000- and 10,000-unit packs.

Storage

This product is fully active when stored desiccated at -20°C.

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