

Native Microorganism Malate Dehydrogenase

Cat. No. DIA-160

Lot. No. (See product label)

Introduction

Description

Malate dehydrogenase is an enzyme in the citric acid cycle that catalyzes the conversion of malate into oxaloacetate (using NAD⁺) and vice versa (this is a reversible reaction). Malate dehydrogenase is not to be confused with malic enzyme, which catalyzes the conversion of malate to pyruvate producing NADPH. Malate dehydrogenase is also involved in gluconeogenesis, the synthesis of glucose from smaller molecules. Pyruvate in the mitochondria is acted upon by pyruvate carboxylase to form oxaloacetate, a citric acid cycle intermediate. In order to get the oxaloacetate out of the mitochondria, malate dehydrogenase reduces it to malate, and it then traverses the inner mitochondrial membrane. Once in the cytosol, the malate is oxidized back to oxaloacetate by cytosolic malate dehydrogenase. Finally, phosphoenol-pyruvate carboxy kinase (PEPCK) converts oxaloacetate to phosphoenol pyruvate.

Applications

This enzyme is useful for enzymatic determination of L-malate and of glutamate oxaloacetate transaminase (GOT) in clinical analysis.

Synonyms

malic dehydrogenase; L-malate dehydrogenase; NAD-L-malate dehydrogenase; malic acid dehydrogenase; NAD-dependent malic dehydrogenase; NAD-malate dehydrogenase; NAD-malic dehydrogenase; malate NAD dehydrogenase; NAD-dependent malate dehydrogenase; NAD-sp; ECific malate dehydrogenase; NAD-linked malate dehydrogenase; MDH; L-malate-NAD⁺ oxidoreductase; S-malate: NAD⁺ oxidoreductase; EC 1.1.1.37; Malate Dehydrogenase

Product Information

Source

Microorganism

Appearance

Slightly yellowish amorphous powder, lyophilized

Form

Freeze dried powder

EC Number

EC 1.1.1.37

CAS No.

9001-64-3

Molecular Weight

approx. 140 kDa

Activity

Gradell 40U/mg-solid or more

Contaminants

Glutamate oxaloacetate transaminase < 1.0×10⁻³% Lactate dehydrogenase < 1.0×10⁻³% NADH oxidase < 1.0×10⁻³%

Isoelectric point

pH 4.8±0.1

pH Stability

pH 3.0-9.0 (25°C, 20hr)

Optimum pH

8

Thermal stability

below 70°C (pH 7.5, 15min)

Optimum temperature

70°C

Michaelis Constant

5.4×10⁻⁵M (L-Malate) 5.0×10⁻⁶M (Oxaloacetate) 8.1×10⁻⁶M (NADH)

<i>Michaelis Constant</i>	$5.4 \times 10^{-4} \text{ M}$ (L-Malate), $5.0 \times 10^{-4} \text{ M}$ (Oxaloacetate), $0.1 \times 10^{-4} \text{ M}$ (NADH)
<i>Structure</i>	4 subunits per mole of enzyme
<i>Inhibitors</i>	Hg ⁺⁺

Storage and Shipping Information

<i>Stability</i>	Stable at -20°C for at least one year
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