MALATE DEHYDROGENASE

L-Malate:NAD^+ oxidoreductase

REACTION:

$$Oxaloacetate + NADH + H^+ \overset{MDH}{\rightleftharpoons} L\text{-}Malate + NAD^+$$

PRODUCT DESCRIPTION

Catalog No.:	qs50046
Appearance:	White amorphous powder
Source:	Microorganism
Enzyme Commission Number:	EC 1.1.1.37
CAS Number:	9001-64-3
Storage temperature:	-20℃
Specific activity:	≥ 200U/mg protein
Unit definition:	One unit will convert one micromole of Oxaloacetate to L-Malate per min at pH 7.5 at 30℃.

PROPERTIES

Molecular weight:	34 kDa (SDS-PAGE)	
Isoelectric point:	4.9	
Michaelis constant:	2.5×10^{-5}M(NADH) 2.0×10^{-5}M (Oxaloacetate)	
Optimum pH:	9.0	{Fig. 1}
Optimum temperature:	55℃	{Fig. 3}
pH Stability:	4.0~8.0(25℃,20hr)	{Fig. 2}
Thermal stability:	< 60℃ (pH7.5, 15min)	{Fig. 4}
Inhibitors:	Cu^{2+},Ni^{2+},SDS	
Effect of various chemicals:		{Table 1}

Table 1.

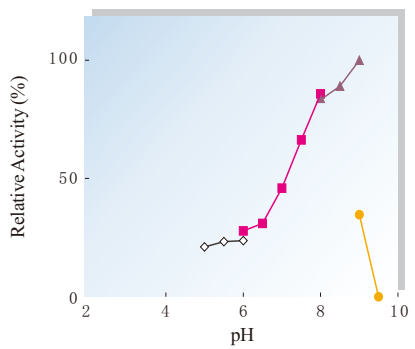
Effect of Various Chemicals on MDH

[The enzyme dissolved in 100mM Tris-HCl buffer, pH 7.5 (17U/ml) was incubated with each chemical at 37℃ for 2hr.]

Chemical	Concn. (mM)	Residual activity
None	-	100%
$CaCl_2$	2.0	103%
$CoCl_2$	2.0	98%
$CuSO_4$	2.0	73%
$FeCl_3$	2.0	105%
$MgSO_4$	2.0	104%
$MnSO_4$	2.0	104%
$NiCl_2$	2.0	37%
$ZnSO_4$	2.0	111%
BME	2.0	111%

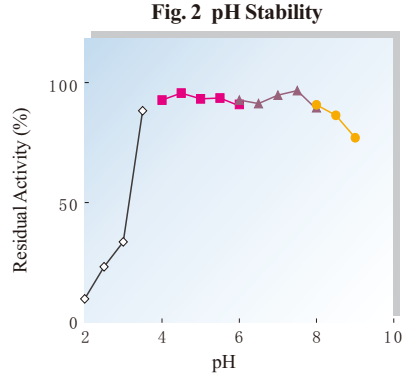
Chemical	Concn. (mM)	Residual activity
NEM	2.0	156%
EDTA	5.0	103%
NaN_3	20.0	108%
Proclin	0.045%	110%
Na-cholate	0.10%	117%
SDS	0. 05%	3%
Triton X-100	0.10%	118%
Tween 20	0.10%	116%
Boric Acid-Borax	2.0	110%

Fig. 1 pH Activity



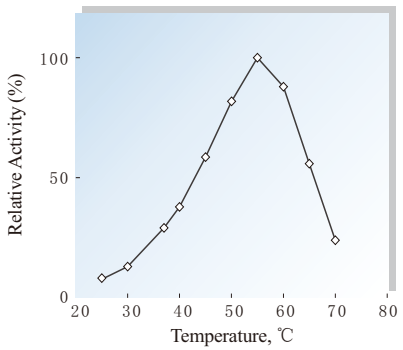
◇ : 50mM acetate buffer
■ : 50mM phosphate buffer
▲ : 50mM Tris-HCl buffer
● : 50mM borate buffer

Fig. 2 pH Stability



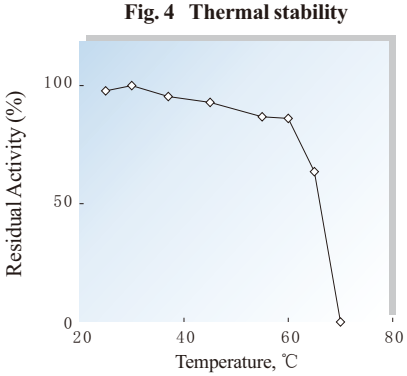
Treatment : 25℃,20hr
◇ : 50mM Glycine-HCl buffer
■ : 50mM acetate buffer
▲ : 50mM phosphate buffer
● : 50mM Tris-HCl buffer

Fig. 3 Temperature activity



Buffer: 50mM K-phosphate buffer , pH 7.5

Fig. 4 Thermal stability



Treatment: 50mM K-phosphate buffer, pH 7.5, 15min