

LEUCINE DEHYDROGENASE

L-Leucine: NAD⁺ oxidoreductase (deaminating)

REACTION:



PRODUCT DESCRIPTION

Catalog No.:	qs50039
Appearance:	White amorphous powder
Source:	Microorganism
Enzyme Commission Number:	EC 1.4.1.9
CAS Number:	9082-71-7
Storage temperature:	-20°C
Specific activity:	≥ 25U/mg protein
Unit definition:	One unit will convert one micromole of L-Leucine to α-Ketoisocaproate per minute at pH 10.5 at 37°C

PROPERTIES

Molecular weight:	43 kDa (SDS-PAGE)	
Isoelectric point:	6.6	
Michaelis constant:	2.6 × 10 ⁻⁴ M (NAD ⁺) 2.0 × 10 ⁻³ M (L-Leucine) 6.8 × 10 ⁻⁴ M (α-Ketoisocaproate) 4.2 × 10 ⁻² M (NH ₄ Cl) 2.3 × 10 ⁻⁴ M (NADH)	
Optimum pH:	above 11.0 (L-Leu → α-KIC), 8.5 (α-KIC → L-Leu)	{Fig. 1}
Optimum temperature:	55-60°C (L-Leu → α-KIC) > 60°C (α-KIC → L-Leu)	{Fig. 3}
pH Stability:	6.0-11.0 (25°C, 15hr)	{Fig. 2}
Thermal stability:	< 55°C (pH 7.0, 20min)	{Fig. 4}
Inhibitors:	Fe ³⁺ , NEM, Proclin, SDS	
Effect of various chemicals:		{Table 1}

Table 1.

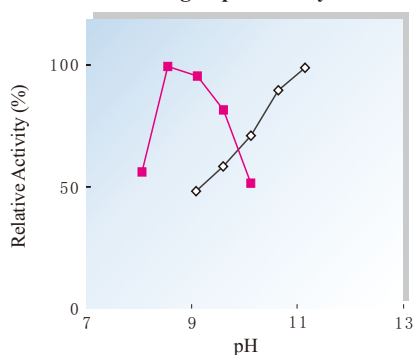
Effect of Various Chemicals on LeuDH

[The enzyme dissolved in 50mM Tris-HCl buffer, pH 7.5 (3U/ml) was incubated with each chemical at 37°C for 2hr.]

Chemical	Concn. (mM)	Residual activity
None	-	100%
CaCl ₂	2.0	100%
CoCl ₂	2.0	109%
CuSO ₄	2.0	108%
FeCl ₃	2.0	75%
MgSO ₄	2.0	97%
MnSO ₄	2.0	96%
NiCl ₂	2.0	110%
ZnSO ₄	2.0	110%

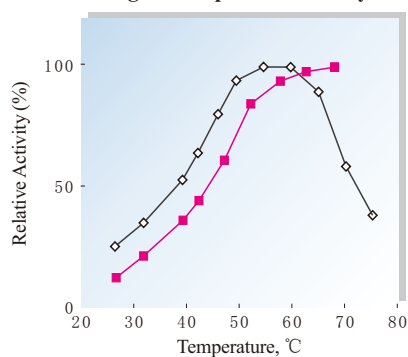
Chemical	Concn. (mM)	Residual activity
BME	2.0	97%
NEM	2.0	75%
EDTA	5.0	99%
Proclin	0.045%	37%
NaN ₃	20.0	100%
Na-cholate	0.10%	108%
SDS	0.05%	36%
Triton X-100	0.10%	112%
Tween 20	0.10%	110%

Fig. 1 pH Activity



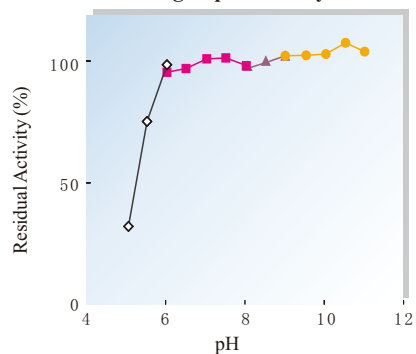
◇ : L-Leu → α-KIC 100mM glycine-NaOH buffer
 ■ : α-KIC → L-Leu 100mM Borate buffer

Fig. 3 Temperature activity



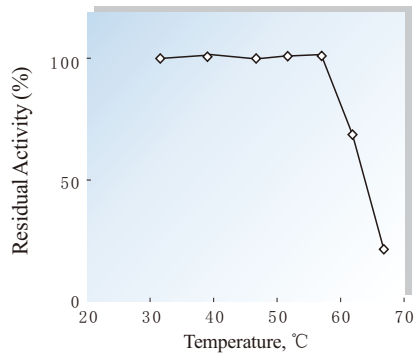
◇ : L-Leu → α-KIC
 Buffer: 200mM glycine-KOH buffer, pH 10.5
 ■ : α-KIC → L-Leu
 Buffer: 100mM Borate buffer, pH 8.5

Fig. 2 pH Stability



Treatment : 25°C, 15hr
 ◇ : 100mM acetate buffer
 ■ : 100mM phosphate buffer
 ▲ : 100mM Tris-HCl buffer
 ● : 100mM Glycine-NaOH buffer

Fig. 4 Thermal stability



Treatment: 50mM phosphate buffer, pH 7.0, 20min