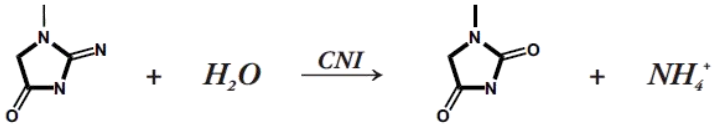
Creatinine deiminase (CNI)

C774080

Creatinine Deiminase (CNI, EC 3.5.4.21) is a hydrolase that specifically catalyzes the ring-opening hydrolysis of creatinine, producing N-methylhydantoin and ammonia (NH_3). This enzyme is commonly found in microorganisms and is widely used in clinical diagnostics for the detection of creatinine levels. It serves as a key enzymatic component in vitro diagnostic reagents for renal function assessment.

Reaction



Creatinine N-Methylhydantoin

Storage Conditions

Store at 4℃ short term (15 days). Store at -20℃ long term (2 years). Upon delivery aliquot. Avoid freeze/thaw cycle. Store in the dark. Desiccated.

Properties

Molecular weight:	46kDa (SDS-PAGE)	
Isoelectric point:	5.8	
Michaelis constant:	6.6×10^{-3}M (Creatinine)	
Optimum pH:	8.0	{Fig. 1}
Optimum temperature:	40~55℃	{Fig. 3}
pH Stability:	7.5~9.5 (30℃, 20hr)	{Fig. 2}
Thermal stability:	< 60℃ (pH 7.5, 60min)	{Fig. 4}
Inhibitors:	Co,Cu^{2+},Fe^{3+},Ni^{2+},Zn^{2+},SDS	
Effect of various chemicals:		{Table 1}

Table 1.

Effect of Various Chemicals on CNI

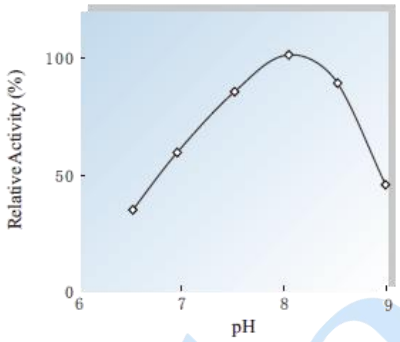
[The enzyme dissolved in 50mM K-phosphate buffer, pH 7.5 (10U/ml) was incubated with each chemical at 37℃ for 2hr.]

Chemical	Concn. (mM)	Residual activity
None	-	100%
$CaCl_2$	2.0	94%
$CoCl_2$	2.0	63%
$CuSO_4$	2.0	43%

$FeCl_3$	2.0	74%
$MgSO_4$	2.0	85%
$MnSO_4$	2.0	91%
$NiCl_2$	2.0	76%
$ZnSO_4$	2.0	15%
$K_4Fe(CN)_6$	2.0	88%

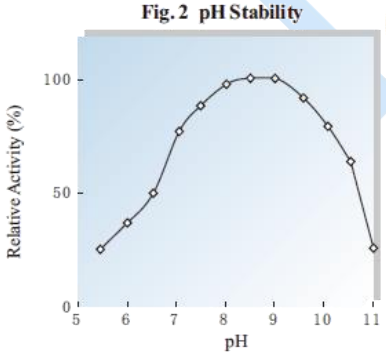
Chemical	Concn. (mM)	Residual activity
BME	2.0	84%
NEM	2.0	82%
EDTA	5.0	83%
NaN_3	20.0	81%
Proclin	0.045%	89%
Na-cholate	0.10%	90%
SDS	0.05%	74%
Triton X-100	0.10%	87%
Tween 20	0.10%	90%

Fig. 1 pH Activity



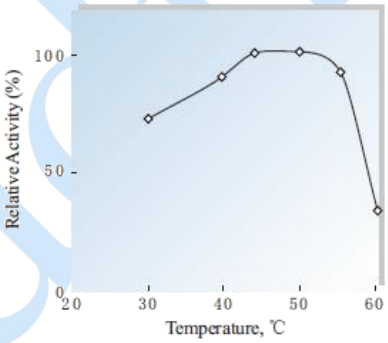
◇:Britton-Robison buffer 37℃

Fig. 2 pH Stability



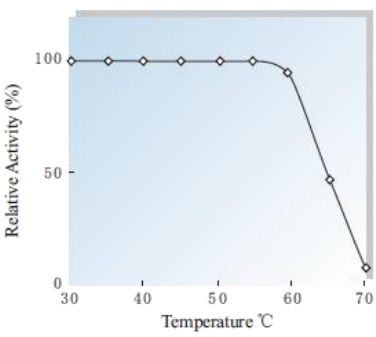
Treatment :30℃,20hr
◇ : Britton-Robison buffer

Fig. 3 Temperature activity



Buffer: 50mM K-phosphate buffer , pH 7.5

Fig. 4 Thermal stability



Treatment: 50mM K-phosphate buffer, pH 7.5,60min