Recombinant Glucose Kinase (GLCK)

G774076

Storage temperature: Store at 2-8℃ short term (1-2 weeks). Store at -20℃ (1 year). Avoid freeze/thaw cycle. Store in the dark. Desiccated.

Introduction:

Glucose Kinase is an enzyme that facilitates phosphorylation of glucose to glucose-6-phosphate. Glucokinase occurs in cells in the liver, pancreas, gut, and brain of humans and most other vertebrates. In each of these organs it plays an important role in the regulation of carbohydrate metabolism by acting as a glucose sensor, triggering shifts in metabolism or cell function in response to rising or falling levels of glucose, such as occur after a meal or when fasting. Mutations of the gene for this enzyme can cause unusual forms of diabetes or hypoglycemia.

Source: Microorganism

Isoelectric point: 5.7

Michaelis constant: 8.0×10 M^{-4} (D-Glucose)

Optimum pH: 9.0-10.0	Fig. 1
Optimum temperature: 40~50℃	Fig. 3
pH Stability: 5.5~10.0 (25℃, 20hr)	Fig. 2
Thermal stability: <50℃ (pH 7.0, 30min)	Fig. 4
Inhibitors: Cu^{2+}, Fe^{3+}, SDS	
Effect of various chemicals:	Table 1

Reaction:

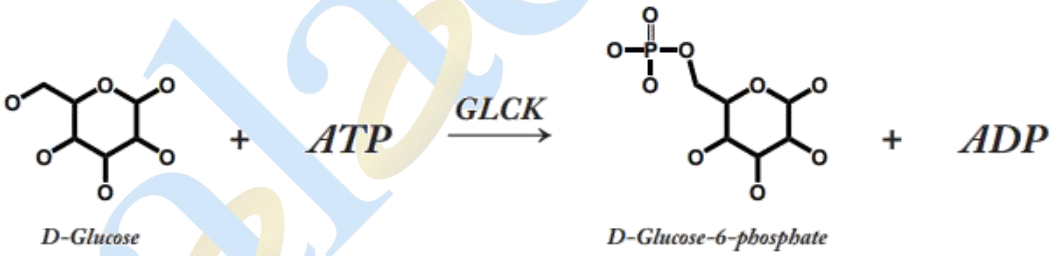


Table 1.

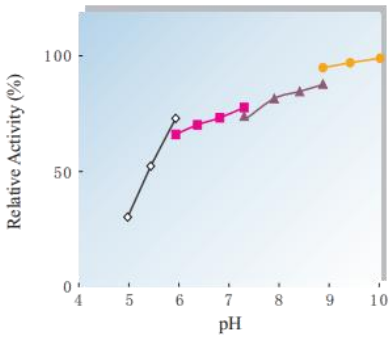
Effect of Various Chemicals on GLCK

[The enzyme dissolved in 50mM Tris-HCl buffer +0.1%BSA, pH 8.0 (10U/ml) was incubated with each chemical at 37℃ for 2hr.]

Chemical	Concn. (mM)	Residual activity
None	-	100%
$CaCl_2$	2.0	100%
$CoCl_2$	2.0	90%
$CuSO_4$	2.0	0%
$FeCl_3$	2.0	26%
$MgSO_4$	2.0	100%
$MnSO_4$	2.0	100%
$NiCl_2$	2.0	98%
$ZnSO_4$	2.0	86%
$K_4Fe(CN)_6$	2.0	87%

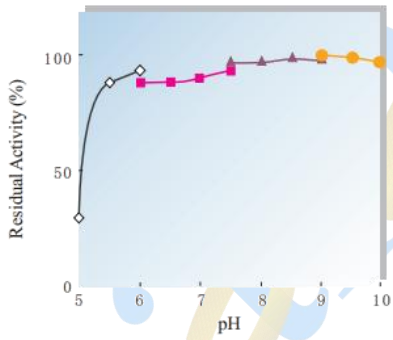
Chemical	Concn. (mM)	Residual activity
BME	2.0	124%
NEM	2.0	91%
EDTA	5.0	100%
NaN_3	20.0	100%
Proclin	0.045%	110%
Na-cholate	0.10%	100%
SDS	0.05%	0%
Triton X-100	0.10%	110%
Tween 20	0.10%	108%

Fig. 1 pH Activity



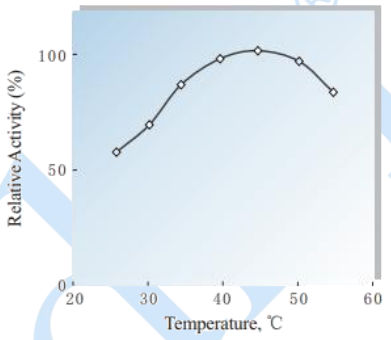
◇ : 50mM acetate buffer
■ : 50mM phosphate buffer
▲ : 50mM Tris buffer
● : 50mM Glycine buffer

Fig. 2 pH Stability



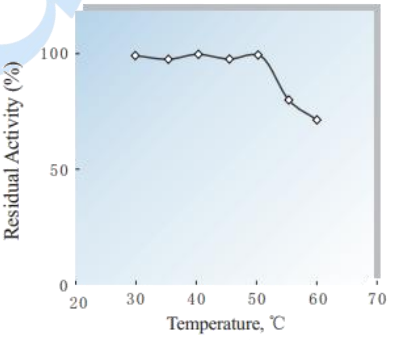
Treatment : 25℃, 24hr
◇ : 50mM acetate buffer
■ : 50mM phosphate buffer
▲ : 50mM Tris buffer
● : 50mM glycine buffer

Fig. 3 Temperature activity



Buffer: 50mM Tris buffer , pH 8.0

Fig. 4 Thermal stability



Treatment: 50mM Tris buffer, pH 8.0, 30min