

Glucose Oxidase HPS200

Catalogue No. GLOX-70-6455

ORIGIN

Aspergillus niger

SPECIFICATIONS

Appearance Yellow freeze dried powder

Powder activity >200 U/mg powder at 25°C

Specific activity >250 U/mg protein at 25°C

Solubility:

- o Dissolves readily at 10 mg/mL in water to give a clear yellow solution essentially free from particulate matter.

Contaminants:

- o GO:Catalase Ratio >2000:1
- o Amylase <0.01 %
- o Invertase <0.01 %
- o Trehalase <0.01%
- o α -Glucosidase <0.01 %
- o β -Glucosidase <0.01%
- o Stability Stable for 2 years stored at -20°C

ASSAY PRINCIPLE

Glucose Oxidase catalyses the following reaction:



UNIT DEFINITION

One unit of activity is defined as the amount of enzyme that will catalyse the oxidation of one micromole of glucose per minute at 25°C under the standard assay method conditions (available on request).

APPLICATION

Used in the determination of D-glucose in blood or urine. Suitable for use in glucose biosensors.

CHARACTERISTICS

HPS200 is a highly purified grade of glucose oxidase for use in biosensors. HPS200 contains very low levels of specific contaminating activities that are likely to cause interference, either by reacting with other sugars in the sample, or by reacting with components of the biosensor itself.

The Table below shows contaminating activities in a typical batch expressed as a % of glucose oxidase activity.

GO:Catalase Ratio	5,263:1
Amylase	0.000074 %
Invertase	0.00053 %
Trehalase	0.0000012 %
α-glucosidase	0.000013 %
β-glucosidase	0.000053 %
Molecular Weight ⁽¹⁾	160,000kD
Structure ⁽¹⁾	Glycoprotein with 2 equal subunits and 2 moles of FAD
Isoelectric point ⁽²⁾	4.2
Km (Calculated in-house)	3 x 10 ⁻² M
pH Optimum (Fig. 1)	pH 5.5 to 7.0
Temperature Optimum (Fig. 2)	37°C
Stable pH range (Fig. 3)	pH 4.0 to 8.0 (25°C for 20 hours)
Thermal stability (Fig. 4)	Stable up to 50°C (pH 7.0 for 15mins)

Activators and Inhibitors (Table 1)

The effect of potential activators and inhibitors was tested in-house by incubating glucose oxidase at 25°C for 1 hour in the presence of each substance listed, prior to determining the residual activity using the standard glucose oxidase assay procedure.

TABLE 1 Activators and Inhibitors

Additive	Residual Activity	Additive	Residual Activity
None (H ₂ O)	100 %	Brij 35	106 %
Magnesium chloride	106 %	Sodium cholate	105 %
Manganese chloride	103 %	2-mercaptoethanol	102 %
Barium acetate	100 %	Triton X-100	100 %
Calcium chloride	100 %	Tween 20	100 %
Cobalt chloride	100 %	Sodium azide	94 %
Iron sulphate	95 %	Dithiothreitol	86 %
Lead acetate	87 %	SDS	55 %
Cadmium chloride	83 %		
Zinc sulphate	81 %		
Nickel chloride	76 %		
Copper sulphate	65 %		
Silver nitrate	52 %		
Mercury chloride	49 %		

Substrate specificity (**Table 2**)

Substrate specificity was tested in-house by substituting different sugars for glucose in the standard glucose oxidase assay procedure.

TABLE 2 Substrate Specificity

Substrate	% of D-glucose activity	Substrate	% of D-glucose activity
D-Glucose	100%	D-Trehalose	0.1%
2-deoxy-D-glucose	10%	Sucrose	0.1%
D-Mannose	1.37%	D-Sorbitol	0.1%
Galactose	1.2%	Glucono-1,5-lactone	0.015%
D-Maltose	1.1%	D-Ribose	0.00013%
Xylose	0.88%	L-Glucose	<0.0001%
D-Fructose	0.40%	D-Mannitol	0.0%

FIG. 1 pH Optimum



◆ SODIUM ACETATE △ MOPS ○ BICINE
 □ MES ▲ POTASSIUM PHOSPHATE

FIG. 2 Temperature Optimum

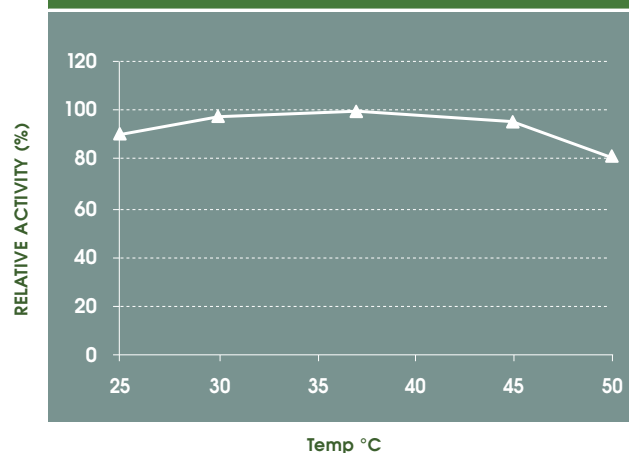
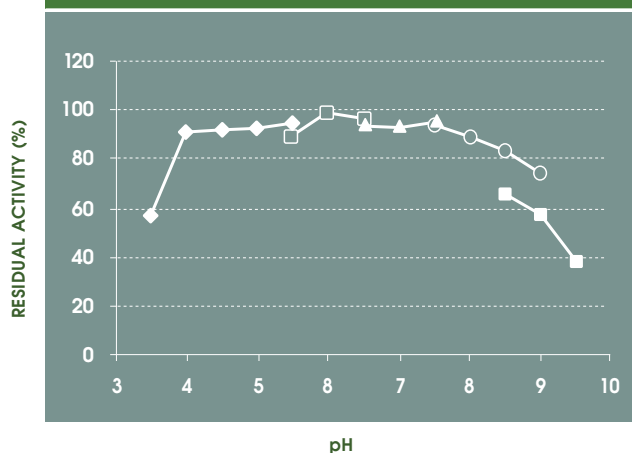
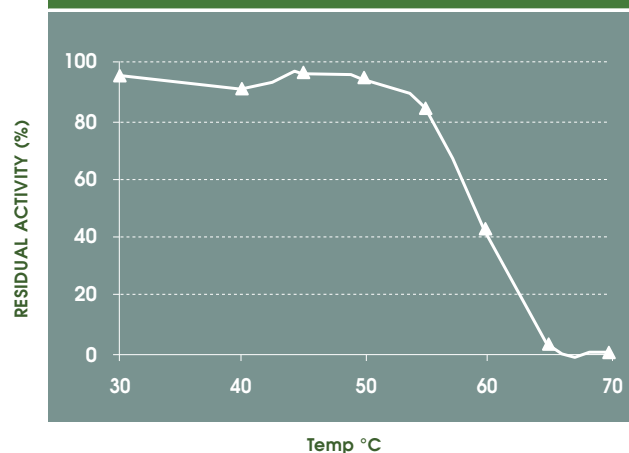


FIG. 3 pH stability (0.1 M buffer 25° for 20 hours)



◆ SODIUM ACETATE ○ BICINE ■ BORATE
 □ MES ▲ POTASSIUM PHOSPHATE

FIG. 4 Thermal Stability (0.1 M Potassium phosphate pH 7 for 15 min.)



References:

- (1) Tsume, H.J., et al. Purification, properties, and molecular features of glucose oxidase from *Aspergillus niger*. J. Biochem., 78, 835-843 (1975).
- (2) Pazar, J.H. and Kleppe, K. The oxidation of glucose and related compounds by the glucose oxidase from *Aspergillus niger*. Biochemistry 3: 578 – 583(1964)

