Glucose Oxidase Type VII
from Aspergillus Niger

Product Number G2133
Storage Temperature –20 °C

CAS# 9001-37-0
EC 1.1.3.4
Synonyms: Gox; β-D-Glucose:oxygen 1-oxidoreductase

Product Description
Glucose Oxidase catalyzes the oxidation of β-D-glucose to form D-glucono-1,5-lactone and hydrogen peroxide.

\[
\text{β-D-glucose} + \text{O}_2 \rightarrow \text{D-glucono-1,5-lactone} + \text{H}_2\text{O}_2
\]

Glucose oxidase can be utilized for the enzymatic determination of D-glucose in solution. As glucose oxidase oxidizes β-D-glucose to D-gluconolactate and hydrogen peroxide, horseradish peroxidase is often used as the coupling enzyme in glucose determinations. Although glucose oxidase is specific for β-D-glucose, solutions of D-glucose can be quantified, as α-D-glucose will mutorotate to β-D-glucose as the β-D-glucose is consumed by the enzymatic reaction.\(^1\)

Molecular weight: 160 kDa (gel filtration)\(^2\)

Glucose Oxidase from Aspergillus Niger is a dimer consisting of 2 equal subunits each with a molecular weight of 80 kDa. Each subunit contains one mole of flavin adenine dinucleotide and one mole of iron. The enzyme is a glycoprotein containing approximately 16% neutral sugar and 2% amino sugar.\(^2\) The enzyme also contains 3 cysteine residues and 8 potential sites for N-linked glycosylation.\(^3\)

Extinction coefficient: \(^4\) \(E^{1%} = 16.7 (280 \text{ nm})\)

Isoelectric point: \(^5\) 4.2

Optimal pH: \(^2\) 5.5 (broad activity range of pH 4-7)

Inhibitors: Ag\(^+\), Hg\(^{2+}\), and Cu\(^{2+}\) ions, phenylmercuric acetate and p-chloromercuribenzoate inhibit glucose oxidase. Nonmetallic sulfhydryl reagents, such as N-ethylmaleimide, iodoacetate, and iodoacetamide, are not inhibitors.\(^6\)

Substrates: Glucose oxidase is relatively specific for β-D-glucose (\(K_M\) of 33-110 mM)\(^7,8\) It also oxidizes D-aldohexoses, monodeoxy-D-glucoses, and methyl-D-glucoses at varying rates. The following substrates are listed in decreasing order of oxidation rate: D-glucose, 2-deoxy-D-glucose, 4-O-methyl-D-glucose, 6-deoxy-D-glucose, 4-deoxy-D-glucose, 3-deoxy-D-glucose, 3-O-methyl-D-glucose

This product is supplied as a lyophilized powder containing phosphate buffer salts and sodium chloride.

Protein content: ≥60% protein (biuret)

Specific activity: ≥100,000 units/g solid (without added oxygen) If the reaction mixture is saturated with oxygen, the activity may increase by up to 100%.

Unit definition: One unit will oxidize 1.0 µmole of β-D-glucose to D-gluconolactone and \(\text{H}_2\text{O}_2\) per minute at pH 5.1 at 35 °C.

Other enzyme activities:
Catalase: ≤10 Sigma units/mg protein
Amylase, maltase, glycogenase, invertase, and galactose oxidase - lot specific results reported on certificate of analysis.

Precautions and Disclaimer
This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Preparation Instructions
This enzyme is soluble (0.2 mg/ml) in 50 mM sodium acetate buffer, pH 5.1, yielding a clear solution.

Storage/Stability
This product is stored at –20 °C and is stable for at least 5 years.
Related Products
Sodium acetate, trihydrate (Product No. S8625)
α-Dianisidine, dihydrochloride (Product No. F5803)
β-D(+)Glucose (Product No. G5250)
Peroxidase, Type II (Product No. P8250)

References

VLR, RBG, MAM 09/05-1