

Product Information

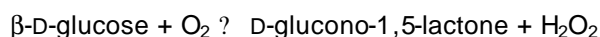
Glucose Oxidase Type VII from *Aspergillus Niger*

Product Number **G2133**
Storage Temperature $-20\text{ }^{\circ}\text{C}$

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.



Glucose oxidase can be utilized for the enzymatic determination of D-glucose in solution. As glucose oxidase oxidizes β -D-glucose to D-gluconolactone 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 mutarotate 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 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-aldoheptoses, 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: $\geq 60\%$ protein (biuret)

Specific activity: $\geq 100,000$ 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 H_2O_2 per minute at pH 5.1 at $35\text{ }^{\circ}\text{C}$.

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 $-20\text{ }^{\circ}\text{C}$ and is stable for at least 5 years.

Related Products

Sodium acetate, trihydrate (Product No. S8625)
o-Dianisidine, dihydrochloride (Product No. F5803)
 β -D(+)-Glucose (Product No. G5250)
Peroxidase, Type II (Product No. P8250)

References

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3. Frederick, K.R., *et al.*, Glucose oxidase from *Aspergillus niger*. Cloning, gene sequence, secretion from *Saccharomyces cerevisiae* and kinetic analysis of a yeast-derived enzyme. J. Biol. Chem., **265**, 3793-3802 (1990).
4. Fasman, G.D., in CRC Handbook of Biochemistry and Molecular Biology, CRC Press (Boca Raton, FL: 1990), p.244 (Product No. C 3671).
5. Pazar, J.H., and Kleppe, K., The Oxidation of Glucose and Related Compounds by Glucose Oxidase from *Aspergillus niger*. Biochemistry, **3**, 578-583 (1964).
6. Nakamura, S., and Ogura, Y., Mode of inhibition of glucose oxidase by metal ions. J. Biochem., **64**, 439-447 (1968).
7. Swoboda, B.E.P., and Massey V., Purification and properties of glucose oxidase from *Aspergillus niger*, J. Biol. Chem., **240**, 2209-2215 (1965).
8. Gibson, Q.H., *et al.*, Kinetics and Mechanism of Action of Glucose Oxidase. J. Biol. Chem., **239**, 3927-3934 (1964).

VLR, RBG, MAM 09/05-1

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