

Product Information

Glucose Oxidase from *Aspergillus niger*

Type X-S, lyophilized powder, 100,000-250,000 units/g solid (without added oxygen)

G7141

Product Description

CAS Registry Number: 9001-37-0

Enzyme Commission (EC) Number: 1.1.3.4

Synonyms: β -D-Glucose:oxygen 1-oxidoreductase, GOx

Storage Temperature: $-20\text{ }^{\circ}\text{C}$

Molecular Mass: $\sim 160\text{ kDa}$ (gel filtration)¹

Isoelectric Point (pI):² 4.2

Extinction coefficient: $E^{1\%} = 16.7\text{ (280 nm)}$ ³

Glucose oxidase from *Aspergillus niger* is a dimer that consists of 2 equal subunits with a molecular weight of 80 kDa each. Each subunit contains one mole of flavin adenine dinucleotide and one mole of iron. The enzyme is a glycoprotein with $\sim 16\%$ neutral sugars and 2% amino sugars.¹ The enzyme also contains 3 cysteine residues and 8 potential sites for *N*-linked glycosylation.⁴

Glucose oxidase oxidizes D-aldohehexoses, monodeoxy-D-glucoses, and methyl-D-glucoses at varying rates, in the following qualitative, decreasing order:

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

Glucose oxidase has a pH optimum of 5.5, and generally has a broad activity range of pH 4-7.² Glucose oxidase is specific for β -D-glucose with a K_m of 33-110 mM.^{5,6}

Glucose oxidase does not require any activators. Inhibitors of glucose oxidase include Ag^+ , Hg^{+2} , Cu^{+2} , phenylmercuric acetate, and *p*-chloromercuribenzoate. Nonmetallic SH-alkylating reagents such as *N*-ethylmaleimide, iodoacetate, and iodoacetamide do not inhibit the enzyme.⁷

Glucose oxidase can be utilized in 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 enzymatic reaction consumes β -D-glucose.⁸

Several theses⁹⁻¹¹ and dissertations¹²⁻²⁰ cite use of this product in their research protocols.

Precautions and Disclaimer

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

Preparation Instructions

This enzyme is soluble (1.0 mg/mL) in 50 mM sodium acetate buffer, pH 5.1, yielding a clear solution.

References

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