



Diagnostic Reagent Grade

Catalog # Aliquot Size

GD03D1-E311H-20	20 KU
GD03D1-E311H-50	50 KU
GD03D1-E311H-100	100 KU
GD03D1-E311H-200	200 KU

Glucose-6-Phosphate Dehydrogenase

EC 1.1.1.49

Catalog # GD03D1-E311H

Lot # 1E1988-3

Product Description

Glucose-6-phosphate dehydrogenase is a diagnostic grade reagent from a microorganism host. This enzyme is useful for enzymatic determination of NAD⁺(NADP⁺) and G-6-P, and activities of phosphoglucose isomerase, phosphoglucomutase and hexokinase. The enzyme is also used for enzymatic determination of glucose and creatine phosphokinase activity when coupled with hexokinase.

PRINCIPLE

D-Glucose-6-phosphate + NAD(P)⁺ $\xrightarrow{\text{G6P dehydrogenase}}$ D-Glucono- δ -lactone-6 phosphate + NAD(P)H + H⁺

STORAGE AND STABILITY

Storage at -20 °C in the presence of a desiccant.

SPECIFICATION

Unit Definition	One unit causes the formation of one micromole of NADH per minute at pH 7.8 at 30°C	
Appearance	: White amorphous powder, lyophilized	
Activity	: 280 U/mg-solid or more (NAD ⁺)	
Contaminants	: Creatine phosphokinase & Phosphoglucomutase	All $\leq 1.0 \times 10^{-3}$ %
	: 6-Phosphogluconate dehydrogenase	$\leq 5.0 \times 10^{-3}$ %
	: Phosphoglucose isomerase	$\leq 1.0 \times 10^{-2}$ %
	: Glutathione reductase	$\leq 1.0 \times 10^{-3}$ %
	: Hexokinase & Myokinase	All $\leq 1.0 \times 10^{-2}$ %
	: NADH oxidase & NADPH oxidase	All $\leq 1.0 \times 10^{-2}$ %

PROPERTIES

Molecular weight	: 55 kDa	
Isoelectric point	: 5.1	
Michaelis constant	: 1.1×10^{-4} M (G6P), 2.0×10^{-4} M (NAD ⁺)	
Inhibitors	: Fe ³⁺ , Ni ²⁺ , Hg ²⁺ , SDS	
Optimum pH	: 7.0 ~ 8.0	(Fig.1)
Optimum temperature	: 55°C	(Fig.2)
pH stability	: pH 4.4~10.5 (25°C, 20hr)	(Fig.3)
Thermal stability	: below 45°C (pH 7.5, 15 min)	(Fig.4)
Substrate specificity	: (Table 1)	
Effect of various chemicals	: (Table 2)	

Manufactured in an ISO 9001 certified facility

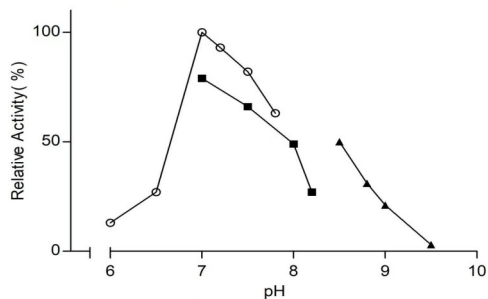
Table 1. Substrate Specificity of Glucose-6-Phosphate Dehydrogenase

Substrate(0.1mM)	Relative activity (%)	Substrate(0.1mM)	Relative activity (%)
Glucose-6-phosphate	100	Fructose-6-phosphate	0
Glucose-1-phosphate	0	Gluconate-6-phosphate	0

Table 2. Effect of Various Chemicals on Glucose-6-phosphate dehydrogenase

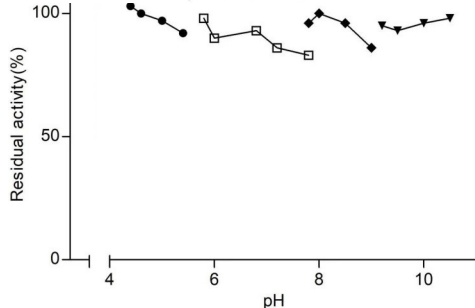
The enzyme was dissolved in 50mM Tris-HCl buffer, pH 7.5 containing 0.1% of BSA (30U/ml) was incubated with each chemical at 25°C for 1hr.

Chemical	Concn.(mM)	Residual activity (%)	Chemical	Concn.(mM)	Residual activity (%)
None	—	100	BME	2	100
CaCl ₂	2	96	Hydroxylamine	2	100
MgSO ₄	2	102	EDTA	5	95
ZnSO ₄	2	101	NaF	20	98
NiCl ₂	2	73	NaN ₃	20	98
CoCl ₂	2	85	Borate	50	99
MnCl ₂	2	104	Proclin-300	0.045% (v/v)	98
FeCl ₃	2	1	SDS	0.05%	0
CuSO ₄	2	115	Na-Cholate	0.1%	102
AgNO ₃	2	99	Tween-20	0.1% (v/v)	99
HgSO ₄	2	0	Triton X-100	0.1% (v/v)	102
NEM	2	98	Span-20	0.1% (v/v)	100
IAA	2	99	Brij-35	0.1%	100

Fig.1. pH Activity


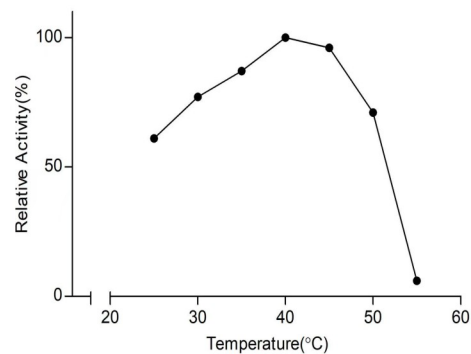
25°C in the following buffer solution:

- 50mM K-phosphate buffer
- 50mM Tris-HCl buffer
- ▲ 50mM Glycine-NaOH buffer

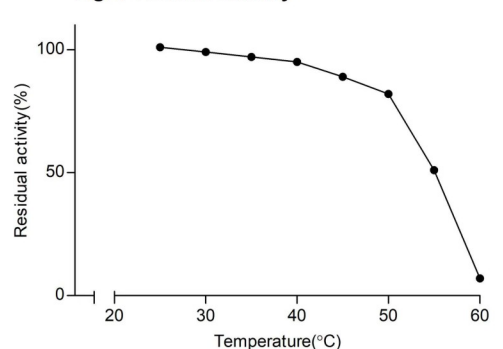


25°C, 20hr-treatment with following buffer solution:

- 0.1M Acetate buffer
- 0.1M K-phosphate buffer
- ◆ 0.1M Tris-HCl buffer
- ▼ 0.1M Glycine-NaOH buffer

Fig.2. Temperature Activity


in 50mM K-phosphate buffer, pH 7.5

Fig.4. Thermal Stability


15min- treatment with 50mM K-phosphate buffer, pH7.0

SAFETY DATA SHEET

Article 1 - Product Identification

Product Name: Glucose-6-Phosphate Dehydrogenase**Catalog # GD03D1-E311H**

This product is sold only for research use by qualified laboratory personnel, and is not to be used as a drug, medical device, food additive, cosmetic, nor household chemical. It is not to be used in diagnostic, therapeutic, consumer, agricultural, nor pesticidal applications.

Supplier of Datasheet: SignalChem Diagnostics Inc.
Street Address: 190-13160 Vanier Place
City, Prov. Postal Code: Richmond, BC, V6V 2J2
Country: Canada
Emergency Phone: 1-888-606-3424 (Toll free)
1-778-326-0223 (local)

Article 2 - Hazard Identification

- **WHMIS Classification:** Not WHMIS controlled.
- **GHS classification:** Not GHS classified.
- **Hazard Pictograms:** No labelling applicable.
- **Signal words:** None.
- **Hazard statements:** None.
- **Precautionary statements:** None.
- **Other hazards:** None known.

Article 3 – Composition/Information on Ingredients

Chemical Characterization: Mixture.

Description: This product contains the substances listed below.

Common name	Chemical name	CAS-No.	Concentration
Triton X-100	2-[4-(2,4,4-trimethylpentan-2-yl)phenoxy]ethanol	9002-93-1	0.05%
EDTA disodium salt dihydrate	Ethylenediaminetetraacetic acid disodium salt-2-hydrate	6381-92-6	0.01%

Article 4 – First-aid Measures

- **General information:** Consult a physician by providing the SDS.
- **After inhalation:** In case of irritation by inhaling this product, move affected person to fresh air and await recovery. If irritation persists, seek immediate medical attention. If casualty cannot breathe, give artificial respiration and seek immediate medical attention.
- **After skin contact:** Immediately wash with soap and plenty of water and rinse thoroughly. Consult a physician.
- **After eye contact:** Rinse opened eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do so. Consult a physician.
- **After swallowing:** Not expected to present a significant ingestion hazard under anticipated conditions of normal use. If you feel unwell, seek medical advice.

Article 5 - Fire-fighting Measures

- **Suitable extinguishing media:** Use water spray, extinguishing powder, carbon dioxide, or other appropriate measure that is suitable to the environment.
- **Specific hazards arising from the substance or mixture:** None known.
- **Special protective equipment and precautions for fire-fighters:** Self-contained breathing apparatus if necessary.

Article 6 – Accidental Release Measures

- **Personal precautions, protective equipment, and emergency procedures:** Apply standard laboratory practices and personal protective equipment. Avoid breathing vapors, mist, or gas. Ensure adequate ventilation.
- **Environmental precautions:** Do not allow to enter drains.
- **Methods and materials for containment and cleaning up:** Absorb on sand or vermiculite and place in closed containers for disposal.

Article 7 - Handling and Storage

- **Precautions for safe handling:** Wear chemical safety goggles and compatible chemical-resistant gloves. Avoid inhalation, contact with eyes, skin or clothing.
- **Conditions for safe storage:** Store according to product label instructions. Keep container upright and tightly closed.

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Article 8 - Exposure Controls/Personal Protection

- **Components with limit monitoring values at workplace:**
NA
- **Appropriate engineering controls:**
Apply adequate ventilation including mechanical exhaust or laboratory fume hood. Follow standard laboratory practices.
- **Individual protection measures:**
 - Respiratory protection:**
Use appropriate respirator if there is inadequate ventilation by following the government standards.
 - Hand protection:**
Wear gloves and use proper glove removal technique to avoid skin contact. Discard gloves after use by following the applicable laboratory regulations. Wash and dry hands.
 - Eye/face protection:**
Safety goggles with side-shields approved under appropriate government standards.
 - Skin/body protection:**
Use appropriate clothing, footwear and any additional protection measures to protect from splashing or contamination.

Article 9 – Physical and Chemical Properties

Appearance: white lyophilized powder	Danger of explosion: Product does not present an explosion hazard.
Odour/Odour Threshold: Not determined.	Explosion limits: Not available.
pH: Not available.	Decomposition temperature: Not available.
Melting point/freezing point: Not determined.	Vapor pressure at 20 °C: Not available.
Boiling point/Boiling range: Not determined.	Density: Not determined.
Flash point: Not determined.	Relative density: Not determined.
Flammability (solid, gaseous): Not determined.	Vapor density: Not determined.
Ignition temperature: Not determined.	Evaporation rate: Not determined.
Auto-igniting: Product is not self-igniting.	Solubility in / Miscibility with Water: Fully miscible.

Article 10 - Stability and Reactivity

- **Reactivity:** Stable under recommended transport and storage conditions.
- **Chemical stability:** Stable under recommended transport and storage conditions.
- **Possible hazardous reactions:** No dangerous reactions known.
- **Conditions to avoid:** Heat and moisture.
- **Incompatible materials:** Not determined.
- **Hazardous decomposition products:** Not determined.

Article 11 - Toxicological Information

- **Acute toxicity:** Not available.
- **LD/LC50:** Not available.
- **Skin corrosion/irritation:** Not available.
- **Serious eye damage/eye irritation:** Not available.
- **Respiratory or skin sensitization:** Not available.
- **Germ cell mutagenicity:** Not available.
- **Carcinogenicity:** No components are listed in IARC, or NTP, or OSHA, or ACGIH.
- **Reproductive toxicity:** Not available.
- **Teratogenicity:** Not available.
- **Specific target organ toxicity - single exposure / - repeated exposure (GHS):** Not available.
- **Aspiration hazard:** Not available.
- **Potential health effects:**
 - Inhalation:** No data available
 - Ingestion:** No data available
 - Skin:** No data available
 - Eyes:** No data available
- **Signs and Symptoms of Exposure:** No data available
- **Synergistic effects:** Not available.

Article 12 - Ecological Information

- **Eco-toxicity:** No data available.
- **Biodegradability:** Not applicable.
- **Bio-accumulative potential:** Not applicable.
- **Mobility in soil:** Not applicable.
- **PBT and vPvB assessment:** Not applicable.

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- **Other adverse effects:** Not applicable.

Article 13 - Disposal Considerations

- **Disposal methods:** In accordance to applicable national, regional, or local laws and regulations. For additional handling information and protection of employees please refer to Article 7 and 8.
- **Contaminated packaging:** Disposal should be made in accordance to official regulations. Use water or cleansing agents to clean the area.

Article 14 - Transport Information

- **DOT:** Not dangerous goods.
- **IMDG:** Not dangerous goods.
- **IATA:** Not dangerous goods.

Article 15 – Regulatory Information

- **WHMIS Classification:** Non-hazardous.
- **GHS label elements:** Not applicable.
- **Signal word:** Not applicable.
- **Hazard statements:** Not applicable.

Article 16 - Other Information

The above information is believed to be correct but does not purport to be all-inclusive and shall be used only as a guide. SignalChem shall not be held liable for any damage resulting from handling or from contact with the above product. See the Technical Specification, Packing Slip, Invoice, and Product Catalog for additional terms and conditions of sale.