MATERIAL SAFETY DATA SHEET

Glucose-6-phosphate dehydrogenase Ex. Yeast

Section 1: Product and Company Identification

Material name **Glucose-6-phosphate dehydrogenase Ex. Yeast**
Synonyms Glucose-6-phosphate dehydrogenase
Product No. GLPD-70-1215
Product description Lyophilized powder containing enzyme (protein) and buffering salts.
Product use Enzyme reagent for laboratory use.

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Corporate Headquarters
Sekisui Diagnostics LLC
31 New York Avenue
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USA
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Section 2: Hazards Identification

OSHA regulatory status This preparation is classified as hazardous under U.S. OSHA 29 CFR 1910.1200; E.C. Directive 1999/45/EC; Canadian R.S. 1985, c. H-3; U.K. CHIP 2002 No. 1689; and/or U.N. GHS ST/SG/AC 10/30. Refer to Sec. 15, Regulatory Information, for details regarding hazard classification.
None of the components present in this preparation at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

Precautionary statements CAUTION! The chemical, physical and toxicological properties of this preparation have not been thoroughly characterized. Avoid contact with eyes and skin. Do not ingest or inhale. Preparation appearance: white powder.

Potential health effects:

- **Routes of exposure** Occupational exposure routes may include eye contact, skin contact and inhalation.
- **Eyes** No data available. Eye exposure may cause irritation, redness and itching.
- **Skin** No data available. Skin contact may cause irritation, dryness and redness.
- **Inhalation** No data available. Although there is no evidence that the enzyme(s) in this preparation induces specific respiratory hypersensitivity, all proteins are potential respiratory allergens and may result in respiratory sensitization in certain individuals after repeated and/or prolonged inhalation exposure, producing mild to severe symptoms similar to pollen allergy or asthma, including mucous membrane or eye irritation, itching of the skin or eyes, sneezing, nasal or sinus congestion, coughing, and tightness in the chest. These symptoms may develop as late as 12 hours after exposure.
- **Ingestion** No data available.
- **Chronic effects** No data available. Repeated inhalation may result in respiratory sensitization.
- **Target organs** Unknown.

Potential environmental effects No data available.

Section 3: Composition / Information on Ingredients

Ingredient Name	CAS #	EC #	% (wt/wt)
Glucose-6-phosphate dehydrogenase	9001-40-5	232-602-6	50 - 70
EC R-Phrases: None	**EC Hazard Class:** None		
Potassium phosphate, monobasic	7778-77-0	231-913-4	20 - 30
EC R-Phrases: None	**EC Hazard Class:** None		
Sodium citrate	68-04-2	200-675-3	10 - 20
EC R-Phrases: None	**EC Hazard Class:** None		
Disodium EDTA	139-33-3	205-358-3	0.5 - 2
EC R-Phrases: None	**EC Hazard Class:** None		

NOTE - Glucose-6-phosphate dehydrogenase - Enzyme source: Yeast, Enzyme Commission number: 1.1.1.49

Section 4: First Aid Measures

First aid procedures:

- **Eye contact** Immediately flush eyes with plenty of tepid water for 15 minutes while separating eyelids with fingers. Remove contact lenses if worn. Obtain medical attention if needed or if symptoms, such as redness or irritation persist.
- **Skin contact** In case of contact, flush skin with cool water and remove contaminated clothing. Obtain medical attention if needed or if irritation or other symptoms develop.
- **Inhalation** If inhaled, move from exposure area to fresh air. Seek medical attention if breathing becomes difficult or if cough or other symptoms develop.
- **Ingestion** In case of ingestion, contact a poison control center or physician for instructions.

Section 5: Fire Fighting Measures

Flammable properties	Material may burn when exposed to sufficient heat.
Suitable extinguishing media	Use extinguishing media suitable for surrounding fire, such as carbon dioxide, chemical foam, dry chemical or water spray.
Unsuitable extinguishing media	Unknown.
Specific hazards arising from the chemical	Toxic gases may be generated by combustion, including. carbon monoxide (CO), carbon dioxide (CO_2) and phosphorus oxides (POx).
Standard protective equipment and precautions for firefighters	Firefighters should wear NIOSH-approved or equivalent Self-Contained Breathing Apparatus and full protective gear.

Section 6: Accidental Release Measures

Personal precautions	Avoid physical contact with material and avoid generating or inhaling dust. Ensure adequate ventilation. Wear Personal Protective Equipment (PPE) as indicated in Section 8. Wash hands thoroughly after handling.
Environmental precautions	No information available.
Methods and materials for containment and clean-up	Do not dry sweep powder. Use HEPA-filtered vacuum, if available, otherwise wet mop to clean up a powder spill. Decontaminate the spill site following standard procedures. Dispose of materials in accordance with all applicable federal, state, local and provincial environmental regulations, per Section 13.

Section 7: Handling and Storage

Handling	Follow good laboratory hygiene practices. See Section 8, Engineering Controls. Minimize contact and contamination of personal clothing and skin. Wash hands thoroughly after handling.
Storage	Store desiccated at -20°C (-4°F). Do not store with incompatible substances; see Section 10.

Section 8: Exposure Controls / Personal Protection

Exposure guidelines	There are no ACGIH, NIOSH, OSHA or country-specific occupational exposure limits currently established for components present in this preparation at concentrations equal to or greater than 1% (0.1% if carcinogen).
Engineering controls	Use in well ventilated areas. If handling large quantities or there is a potential for dust or aerosol generation, use local exhaust ventilation. Facilities storing or using this material should be equipped with an eyewash fountain and a safety shower.

Personal protective equipment:

Eye / face protection	Wear appropriate protective chemical safety glasses.
Skin protection	Wear lab coat or other protective garments. Remove contaminated clothing promptly.
Hand protection	Wear chemical resistant protective gloves.
Respiratory protection	A respirator is not required under normal conditions of use.
General	Follow company-specific safety procedures.

Section 9: Physical and Chemical Properties

Appearance	White powder
Odor	Not available
pH	Not applicable
Melting point/Freezing point	Not available / Not applicable
Boiling point	Not applicable
Flash point	Not available
Evaporation rate	Not applicable
Flammability/explosivity limits in air, upper	Not available
Flammability/explosivity limits in air, lower	Not available
Vapor pressure	Not available
Density	Not available
Solubility	Water-soluble
Partition coefficient (n-octanol/water)	Not available
Auto-ignition temperature	Not available

Section 10: Chemical Stability and Reactivity Information

Possibility of hazardous reactions	Hazardous polymerization will not occur.
Chemical stability	Stable under ordinary conditions of use and storage. See Section 7.
Conditions to avoid	Unknown.
Incompatible materials	Unknown.
Hazardous decomposition products	Thermal decomposition may lead to release of irritating gases and vapors.

Section 11: Toxicological Information

Acute effects:

Toxicological data - Selected LD50s and LC50s

Disodium EDTA	139-33-3	Oral LD50 Rat: 2 g/kg
Potassium phosphate, monobasic	7778-77-0	Dermal LD50 Rabbit: >4640 mg/kg
Local effects	No data available.	
Chronic effects	No data available.	
Sensitization	No data available.	
Carcinogenicity	No data available.	
Mutagenicity	No data available.	
Reproductive effects	No data available.	
Teratogenicity	No data available.	

Section 12: Ecological Information

Ecotoxicity:

Ecotoxicity - Freshwater Algae Data		
Sodium citrate	68-04-2	96 Hr EC50 Chlorella vulgaris: 1800-3200 mg/L
Ecotoxicity - Freshwater Fish Species Data		
Disodium EDTA	139-33-3	96 Hr LC50 Lepomis macrochirus: 159 mg/L [static]; 96 Hr LC50 Poecilia reticulata: 320 mg/L [semi-static]
Sodium citrate	68-04-2	96 Hr LC50 Poecilia reticulata: 18000 mg/L
Ecotoxicity - Microtox Data		
Disodium EDTA	139-33-3	8 Hr EC50 Pseudomonas putida: 56 mg/L
Sodium citrate	68-04-2	8 Hr EC50 Pseudomonas fluorescens: 1800-3200 mg/L
Ecotoxicity - Water Flea Data		
Sodium citrate	68-04-2	48 Hr EC50 Daphnia magna: 5600 mg/L
Persistence and degradability	No data available.	
Bioaccumulation potential	No data available.	
Mobility in environmental media	No data available.	

Section 13: Disposal Considerations

Methods of disposal	Dispose of unused product, spilled material and waste in accordance with all applicable federal, state, local and provincial environmental and hazardous waste regulations.

Section 14: Transport Information

Basic shipping description	Not classified as dangerous goods. Not regulated per IATA and DOT regulations.

Section 15: Regulatory Information

US Federal Regulations:

Inventory - United States - Section 8(b) Inventory (TSCA):

Disodium EDTA	139-33-3	Present
Glucose-6-phosphate dehydrogenase	9001-40-5	XU
Potassium phosphate, monobasic	7778-77-0	Present
Sodium citrate	68-04-2	Present

International Regulations:

Canada - WHMIS - Classifications of Substances		
Disodium EDTA	139-33-3	Uncontrolled product according to WHMIS classification criteria (including 3.5%)
Potassium phosphate, monobasic	7778-77-0	Uncontrolled product according to WHMIS classification criteria
Sodium citrate	68-04-2	Uncontrolled product according to WHMIS classification criteria (anhydrous)
Germany - Water Classification (VwVwS) - Annex 2 - Water Hazard Classes		
Disodium EDTA	139-33-3	ID Number 104, hazard class 2 - hazard to waters
Inventory - Australia - Inventory of Chemical Substances (AICS)		
Disodium EDTA	139-33-3	Present
Glucose-6-phosphate dehydrogenase	9001-40-5	Present
Potassium phosphate, monobasic	7778-77-0	Present
Sodium citrate	68-04-2	Present
Inventory - Canada - Domestic Substances List (DSL)		
Disodium EDTA	139-33-3	Present
Potassium phosphate, monobasic	7778-77-0	Present
Sodium citrate	68-04-2	Present
Inventory - Canada - Organisms on the Domestic Substances List (DSL)		
Glucose-6-phosphate dehydrogenase	9001-40-5	IUB #1.1.1.49
Inventory – China		
Disodium EDTA	139-33-3	Present
Glucose-6-phosphate dehydrogenase	9001-40-5	Present
Potassium phosphate, monobasic	7778-77-0	Present
Sodium citrate	68-04-2	Present
Inventory - European Union - European Inventory of Existing Commercial Chemical Substances (EINECS)		
Disodium EDTA	139-33-3	205-358-3
Glucose-6-phosphate dehydrogenase	9001-40-5	232-602-6
Potassium phosphate, monobasic	7778-77-0	231-913-4
Sodium citrate	68-04-2	200-675-3
Inventory - Japan Existing and New Chemical Substances (ENCS)		
Disodium EDTA	139-33-3	2-1265
Potassium phosphate, monobasic	7778-77-0	1-452
Sodium citrate	68-04-2	2-1323
Inventory - Korea - Existing and Evaluated Chemical Substances		
Disodium EDTA	139-33-3	KE-13651
Glucose-6-phosphate dehydrogenase	9001-40-5	KE-09578
Potassium phosphate, monobasic	7778-77-0	KE-28622
Sodium citrate	68-04-2	KE-20843
Canadian Hazardous Products		
WHMIS Status	Non-controlled	
European Communities Dangerous Substances/Preparations		
EC Hazard Class	None	
Risk Phrases	None	
Safety Phrases	None	

Section 16: Other Information

Further Information:
This MSDS has been prepared in accordance with the ANSI Z400.1 format. Every effort has been made to adhere to the hazard criteria and content requirements of the U.S. OSHA Hazard Communication Standard, Canadian Controlled Products Regulation (CPR), UK Chemical Hazard Information and Packaging Regulations, European Communities REACH Regulation, and UN Globally Harmonized System of Classification and Labelling of Chemicals.

MSDS Origination Date: 17 March, 2005
Version #: 3
Revision Date: 29 November, 2012

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