



MATERIAL SAFETY DATA SHEET

Hexokinase

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Hexokinase

Product Number: 70-1351-01; 70-1351-04; 70-1351-10; 70-1351-20; 70-1351-60; HEXO-70-1351

Synonym(s): Hexokinase Ex. Yeast

Product Use: Enzyme reagent for laboratory use.

Description: Lyophilized powder containing enzyme (protein) and buffering salts.

Corporate Headquarters

Genzyme Corporation

500 Kendall Street
Cambridge, MA 02142
USA

Phone: 617-252-7500

Manufacturer/Distributor

Genzyme Diagnostics

50 Gibson Drive
Kings Hill, West Malling
Kent, ME19 4AF
UK

Phone: 44 (0) 1732 220022

Distributor

Genzyme Diagnostics

31 New York Avenue
Framingham, MA 01701-9322
USA

Phone: 800-332-1042

Emergency Telephone Numbers

Genzyme (U.S.): 617-562-4555

CHEMTREC (U.S.): 800-424-9300

CHEMTREC (Outside U.S.): 703-527-3887

2. HAZARDS IDENTIFICATION

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 to off-white powder.

Routes of Exposure:

Occupational exposure routes may include eye contact, skin contact and inhalation.

Potential Health Effects:

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.
Eye	No data available. Eye exposure may cause irritation, redness and itching.
Skin	No data available. Skin contact may cause irritation, dryness and redness.
Ingestion	No data available.
Chronic Effects	No data available. Repeated inhalation may result in respiratory sensitization.
Target Organs	Unknown.



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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.

Potential Environmental Effects:

No data available.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient Name	CAS #	EC #	% (wt/wt)
Hexokinase EC R-Phrases: None	9001-51-8 EC Hazard Class: None	232-611-5	60 - 70
Sodium phosphate dibasic, anhydrous EC R-Phrases: None	7558-79-4 EC Hazard Class: None	231-448-7	20 - 30
Citric acid EC R-Phrases: None	77-92-9 EC Hazard Class: None	201-069-1	1 - 10
Ethylenediamine tetraacetic acid (EDTA) EC R-Phrases: R36	60-00-4 EC Hazard Class: Xi	200-449-4	1 - 5

NOTE - Hexokinase - Enzyme source: Yeast, Enzyme Commission number: 2.7.1.1

4. FIRST AID MEASURES

Inhalation:

If inhaled, move from exposure area to fresh air. Seek medical attention if breathing becomes difficult or if cough or other symptoms develop.

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.

Ingestion:

In case of ingestion, contact a poison control center or physician for instructions.

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.



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Specific Hazards Arising from the Chemical:

Toxic gases may be generated by combustion, including carbon monoxide (CO), carbon dioxide (CO₂), nitrogen oxides (NO_x) and phosphorus oxides (PO_x).

Standard Protective Equipment and Precautions for Firefighters:

Firefighters should wear NIOSH-approved or equivalent Self-Contained Breathing Apparatus and full protective gear.

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.

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.

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 (PPE):

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

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	White to off-white powder	pH:	Not applicable
Odor:	Not available	Solubility:	Water-soluble



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Boiling Point:	Not applicable	Evaporation Rate:	Not applicable
Melting Point:	Not available	Density:	Not available
Freezing Point:	Not applicable	Vapor Pressure:	Not available
		Partition Coefficient (n-octanol/water):	Not available
Flammability/Explosivity Limits in Air, Lower:	Not applicable		
Flammability/Explosivity Limits in Air, Upper:	Not applicable		
Auto-Ignition Temperature:	Not available		
Flash Point:	Not applicable		

10. STABILITY AND REACTIVITY

Chemical Stability:

Stable under ordinary conditions of use and storage. See Section 7.

Conditions to Avoid:

Unknown.

Incompatible Materials:

Physical Properties - Chemical Incompatibilities

Citric acid	77-92-9	Incompatible with bases, strong oxidizers, amines. Contact with metal nitrates may be explosive. Attacks aluminum, copper, zinc, and their alloys, when wet.
Ethylenediamine tetraacetic acid (EDTA)	60-00-4	Incompatible with sulfuric acid, bases, ammonia, aliphatic amines, alkanolamines, isocyanates, alkylene oxides, epichlorohydrin.

Hazardous Decomposition Products:

Thermal decomposition may lead to release of irritating gases and vapors.

Possibility of Hazardous Reactions:

Hazardous polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Acute Effects:

Toxicology Data - Selected LD50s and LC50s

Citric acid	77-92-9	Oral LD50 Rat: 3000 mg/kg
Ethylenediamine tetraacetic acid (EDTA)	60-00-4	Oral LD50 Rat: 1658 mg/kg; Dermal LD50 Rat: >2000 mg/kg
Sodium phosphate dibasic, anhydrous	7558-79-4	Oral LD50 Rat: 17 g/kg

Local Effects:

No data available.

Chronic Effects:

No data available.

Carcinogenicity:

No data available.

Mutagenicity:

No data available.

Teratogenicity:

No data available.



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Reproductive Effects:

No data available.

Sensitization:

No data available.

12. ECOLOGICAL INFORMATION

Ecotoxicity:

Ecotoxicity - Freshwater Algae Data

Ethylenediamine tetraacetic acid (EDTA) 60-00-4 72 Hr EC50 Scenedesmus subspicatus: 1.01 mg/L

Ecotoxicity - Freshwater Fish Species Data

Citric acid 77-92-9 96 Hr LC50 Lepomis macrochirus: 1516 mg/L [static]; 96 Hr LC50 Leuciscus idus: 440 mg/L [static]

Ethylenediamine tetraacetic acid (EDTA) 60-00-4 96 Hr LC50 Lepomis macrochirus: 41 mg/L [static]; 96 Hr LC50 Pimephales promelas: 59.8 mg/L [static]

Ecotoxicity - Microtox Data

Citric acid 77-92-9 15 min EC50 Photobacterium phosphoreum: 14 mg/L

Ecotoxicity - Water Flea Data

Citric acid 77-92-9 72 Hr EC50 Daphnia magna: 120 mg/L

Ethylenediamine tetraacetic acid (EDTA) 60-00-4 96 Hr EC50 water flea: >100 mg/L [Static] (as trisodium salt)

Persistence and Degradability:

No data available.

Bioaccumulative Potential:

No data available.

Mobility in Environmental Media:

No data available.

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.

14. TRANSPORT INFORMATION

Basic Shipping Description:

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

15. REGULATORY INFORMATION

US Federal Regulations:

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

Citric acid	77-92-9	Present
Ethylenediamine tetraacetic acid (EDTA)	60-00-4	Present
Hexokinase	9001-51-8	XU
Sodium phosphate dibasic, anhydrous	7558-79-4	Present

U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

Ethylenediamine tetraacetic acid (EDTA)	60-00-4	5000 lb final RQ; 2270 kg final RQ
Sodium phosphate dibasic, anhydrous	7558-79-4	5000 lb final RQ; 2270 kg final RQ

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US State Regulations:

U.S. - California - 8 CCR Section 339 - Director's List of Hazardous Substances

Ethylenediamine tetraacetic acid (EDTA)	60-00-4	Present
Sodium phosphate dibasic, anhydrous	7558-79-4	Present

International Regulations:

Canada - WHMIS - Classifications of Substances

Citric acid	77-92-9	E (including 40%)
Ethylenediamine tetraacetic acid (EDTA)	60-00-4	D2B

Canada - WHMIS - Ingredient Disclosure List

Citric acid	77-92-9	1 %
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Germany - Water Classification (VwVwS) - Annex 2 - Water Hazard Classes

Citric acid	77-92-9	ID Number 57, hazard class 1 - low hazard to waters
Ethylenediamine tetraacetic acid (EDTA)	60-00-4	ID Number 104, hazard class 2 - hazard to waters
Sodium phosphate dibasic, anhydrous	7558-79-4	ID Number 330, hazard class 1 - low hazard to waters

Inventory - Australia - Inventory of Chemical Substances (AICS)

Citric acid	77-92-9	Present
Ethylenediamine tetraacetic acid (EDTA)	60-00-4	Present
Hexokinase	9001-51-8	Present
Sodium phosphate dibasic, anhydrous	7558-79-4	Present

Inventory - Canada - Domestic Substances List (DSL)

Citric acid	77-92-9	Present
Ethylenediamine tetraacetic acid (EDTA)	60-00-4	Present
Sodium phosphate dibasic, anhydrous	7558-79-4	Present

Inventory - Canada - Organisms on the Domestic Substances List (DSL)

Hexokinase	9001-51-8	IUB #2.7.1.1
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Inventory - China

Citric acid	77-92-9	Present
Ethylenediamine tetraacetic acid (EDTA)	60-00-4	Present
Sodium phosphate dibasic, anhydrous	7558-79-4	Present

Inventory - European Union - European Inventory of Existing Commercial Chemical Substances (EINECS)

Citric acid	77-92-9	201-069-1
Ethylenediamine tetraacetic acid (EDTA)	60-00-4	200-449-4
Hexokinase	9001-51-8	232-611-5
Sodium phosphate dibasic, anhydrous	7558-79-4	231-448-7

Inventory - Japan Existing and New Chemical Substances (ENCS)

Citric acid	77-92-9	2-1318
Ethylenediamine tetraacetic acid (EDTA)	60-00-4	2-1263; 2-1296
Sodium phosphate dibasic, anhydrous	7558-79-4	1-497

Inventory - Korea - Existing and Evaluated Chemical Substances

Citric acid	77-92-9	KE-20831
Ethylenediamine tetraacetic acid (EDTA)	60-00-4	KE-13648
Sodium phosphate dibasic, anhydrous	7558-79-4	KE-12344

Canadian Hazardous Products:

WHMIS Status Controlled

Classification

D2B - Other Toxic Effects-TOXIC



European Communities Dangerous Substances/Preparations:

EC Hazard Class None

Risk Phrases None



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Safety Phrases None

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: February 28, 2006

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