Material Safety Data Sheet

Revision Date: 01-14-2023

Kit Name: In Situ TUNEL Apoptosis Detection Kit (50 Assays)
SKU#: VB-4005

Components:

VB-4005-1	Protein K stock Solution (20×)
VB-4005-2	1× Proteinase K working buffer
VB-4005-3	TdT equilibration buffer
VB-4005-4	TdT enzyme
VB-4005-5	Biotinylated dUTP
VB-4005-6	TUNEL positive FFPE slides

VB-4005-1 Proteinase K Stock Solution (20×) MSDS

1. Identification of the Substance/Mixture and Company

Product Name	Proteinase K Stock Solution (20×)
Catalog#	VB-4005-1
Product Description	Component
Manufacturer/Supplier	VitroVivo Biotech, LLC. 405 E Gude Dr., Suite 214, Rockville, MD 20850
Tel/fax Number	Phone: 301-500-0499; Toll free: 1-800-260-9817 Fax: 844-248-6208

2. Hazards Identification

Hazard Classification
Skin corrosion/irritation - Category 2
Serious eye damage/eye irritation - Category 2A
Skin sensitizer - Category 1
Respiratory Sensitizer - Category 1
Specific Target Organ Toxicity Single Exposure - Category 3

Label Elements
Hazard Symbols
Signal Word: Danger

Hazard Statements
Causes serious eye irritation.
Causes skin irritation.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause an allergic skin reaction.
May cause drowsiness and dizziness.
May cause respiratory irritation.

Precautionary Statements
Prevention
Wear eye/face protection.
Use only in well-ventilated areas.
Wear protective gloves.
In case of inadequate ventilation wear respiratory protection.

3. Composition/information on ingredients

Mixtures Description: Mixture of the substances listed below.
Composition:

Component	CAS#
Proteinase K	39450-01-6
Tris	77-86-1
EDTA	60-00-04
Glycerol	56-81-5

4. First Aid Measures

Description of necessary first-aid measures
Eyes
Immediately flood the eye with plenty of water for at least 15 minutes, holding the eye open. Obtain medical attention if soreness or redness persists.

Skin
Wash affected area with plenty of water. Seek medical attention if symptoms persist.

Ingestion

Do not induce vomiting. Have victim drink 1-3 glasses of water to dilute stomach contents. Never administer anything by mouth if a victim is losing consciousness, is unconscious or is convulsing. Obtain medical attention immediately.

Inhalation
Remove from exposure. If there is difficulty in breathing, give oxygen. Obtain medical attention if symptoms persist.

Most important symptoms/effects, acute and delayed
Aside from the information found under description of necessary first aid measures (above) and Indication of immediate medical attention and special treatment needed, no additional symptoms and effects are anticipated.

Indication of immediate medical attention and special treatment needed Notes to Physicians
Treat symptomatically.

5. Firefighting Measures

Suitable (and unsuitable) Extinguishing Media
Use foam, dry chemical or carbon dioxide. Use water spray for surroundings and containers.

Specific hazards arising from the chemical
None known.

Special Protective Actions for Fire-Fighters
Wear full protective clothing and self-contained breathing apparatus

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures
Wear appropriate protective clothing.

Environmental Precautions
Prevent the material from entering drains or watercourses.

Methods and materials for containment and cleaning up
Contain and absorb using earth, sand or other insert material. Transfer into suitable containers for recovery or disposal.

7. Handling and Storage

Precautions for safe handling
Wear appropriate protective equipment when handling. Do not eat or drink while handling this material.

Conditions for safe storage
Store at room temperature away from heat and direct sunlight

8. Exposure Controls/Personal Protection

Control parameters
Exposure limits are listed below, if they exist.

Proteinase K
None established.

Appropriate engineering controls
No specific measures necessary.

Individual protection measures
Respiratory Protection
Respiratory protection not normally required.

Skin Protection
Chemical resistant gloves Eye/Face Protection Chemical goggles or safety glasses with side shields

Body Protection

Normal work wear.

9. Physical and Chemical Properties

Information on basic physical and chemical properties

Physical State: Liquid
Appearance: clear, colorless
Odor: odorless
pH: 8.0
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: Not available.
Decomposition Temperature: Not available.
Solubility: Soluble.
Specific Gravity/Density: Not available.
Molecular Formula: Solution
Molecular Weight: Not available.

10 Stability and Reactivity

Reactivity
No known reactivity.

Chemical Stability
Stable under normal conditions.

Possibility of hazardous reactions
Hazardous polymerization will not occur.

Conditions to Avoid
Heat – high temperatures

Incompatible Materials
Strong acids – alkalines – oxidizing agents

Hazardous Decomposition Products
None known

11. Toxicological Information

Acute Toxicity
No data available to indicate product is acutely toxic.

Specific Target Organ Toxicity (STOT) – single exposure
Available information indicates this product may cause respiratory irritation.

Specific Target Organ Toxicity (STOT) – repeat exposure
No data available to indicate product or components will cause target organ effects after repeated exposure.

Serious Eye damage/Irritation
Available information indicates this product causes serious eye irritation.

Skin Corrosion/Irritation
Available information indicates this product causes skin irritation.

Respiratory or Skin Sensitization
Available information indicates this product can cause skin or respiratory sensitization.

Carcinogenicity
No data available to indicate product may present a carcinogenic hazard.

Germ Cell Mutagenicity
No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Reproductive Toxicity
No data available to indicate either product or components present at greater than 0.1% may cause reproductive toxicity or birth defects.

Aspiration Hazard
Not an aspiration hazard.

12. Ecological Information

Ecotoxicity
No relevant studies identified.

Mobility in soil
No relevant studies identified.

Persistence/Degradability
No relevant studies identified.

Bioaccumulative Potential
No relevant studies identified.

Other adverse effects
No relevant studies identified.

13. Disposal Considerations

Waste treatment methods

General information	When handling waste, the safety precautions applying to handling of the product should be considered.
Disposal methods	Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority.

14. Transport Information

DOT CFR 172.101 Data Not Regulated
UN Proper Shipping Name Not Regulated
UN Class None. UN Number None.
UN Packaging Group None.

Classification for AIR Transportation (IATA) Consult current IATA Regulations prior to shipping by air.

Environmental Hazards Not a marine pollutant

15. Regulatory Information

United States TSCA Inventory
This product is exempt from listing on the US Toxic Substance Control Act (TSCA) Chemical Substance Inventory.

Canada DSL Inventory
This product is not listed on the Domestic Substance List (DSL).

WHMIS Classification
D2A.D2B

This product was classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations and the MSDS contains all the information required by these regulations.

SARA Title III Sect. 311/312 Categorization
Immediate (Acute)

16. Other Information

This information contained herein is believed to be accurate but is not warranted to be so. Data and calculations are based on information furnished by the manufacturer of the product and manufacturers of the components of the product. Users are advised to confirm in advance of need that information is current, applicable and suited to the circumstances of use. Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Furthermore, vendor assumes no responsibility for injury caused by abnormal use of the material even if reasonable safety procedures are followed. Any questions regarding this product should be directed to the manufacturer of the product as described in Section 1.

Abbreviations and acronyms:
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent LD50: Lethal dose, 50 percent

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VB-4005-2 1× Proteinase K working Buffer MSDS

1. Identification of the Substance/Mixture and Company

Product Name	1× Proteinase K working buffer
Catalog#	VB-4005-2
Product Description	Component
Manufacturer/Supplier	VitroVivo Biotech, LLC. 405 E Gude Dr., Suite 214, Rockville, MD 20850
Tel/fax Number	Phone: 301-500-0499; Toll free: 1-800-260-9817 Fax: 844-248-6208

2. Hazards Identification

Classification of the substance or mixture

Appearance: clear, colorless liquid
Caution! May cause eye, skin, and respiratory tract irritation. This is expected to be a low hazard for usual handing.
Target Organs: none

Potential Health Effects
Eye: May cause eye irritation.
Skin: May cause skin irritation.
Ingestion: May cause respiratory of the digestive. Low hazard for usual industrial handing.
Chronic: No information found.

3. Composition/information on ingredients

Mixtures Description: Mixture of the substances listed below.
Composition:

Component	CAS#
EDTA	60-00-4
Tris, Hydrochloride	1185-53-1

4. First Aid Measures

Eye Contact	Rinse thoroughly with plenty of water, also under the eyelids. Get medical qattention if symptoms occur.
Skin Contact	Rinse skin with water. Get medical attention if symptoms occur.
Inhalation	Remove to fresh air. Get medical attention if symptoms occur. If not breathing, give artificial respiration.
Ingestion	Do NOT induce vomiting. Get medical attention.
Most important symptoms and effects	No information available.
Notes to Physician	Treat symptomatically

5. Firefighting Measures

Suitable Extinguishing Media	Substance is nonflammable; use agent most appropriate to extinguish surrounding fire.
Unsuitable Extinguishing Media	No information available
Flash Point	Not applicable Method – No information available
Autoignition Temperature	No information available
Explosion Limits	

Upper No data available
Lower No data available
Sensitivity to Mechanical Impact No information available
Sensitivity to Static Discharge No information available

Specific Hazards Arising from the Chemical
Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes.

Hazardous Combustion Products
Nitrogen oxides (NOx).

Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA
Health 1 Flammability 0 Instability 0 Physical hazards N/A

6. Accidental Release Measures

Personal Precautions Use personal protective equipment as required. Avoid contact with skin and eyes.

Environmental Precautions Avoid release to the environment. See Section 12 for additional Ecological Information.

Methods for Containment and Clean Up Soak up with inert absorbent material. Keep in suitable, closed

7. Handling and Storage

Precautions for safe handling
For precautions see section 2.2.

Conditions for safe storage, including any incompatibilities

Storage conditions
Tightly closed.

Storage stability
Recommended storage temperature 2 - 8 °C
Storage class (TRGS 510): 12: Non Combustible Liquids

Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. Exposure Controls/Personal Protection

Control parameters

Ingredients with workplace control parameters
Contains no substances with occupational exposure limit values.

Exposure controls

Appropriate engineering controls
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.

Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

Skin protection
required Body Protection protective clothing

Respiratory protection
required when vapours/aerosols are generated. Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains.

9. Physical and Chemical Properties

Physical State	Liquid
Appearance	Colorless
Odor	Odorless
Odor Threshold	No information available
pH	8.0
Melting Point/Range	No data available
Boiling Point/Range	No information available
Flash Point	No information available
Evaporation Rate	No information available
Flammability (solid,gas)	Not applicable
Flammability or explosive limits	
Upper	No data available
Lower	No data available
Vapor Pressure	No information available
Vapor Density	No information available
Specific Gravity	No information available
Solubility	No information available
Partition coefficient; n-octanol/water	No data available
Autoignition Temperature	No information available
Decomposition Temperature	No information available
Viscosity	No information available

10 Stability and Reactivity

Reactivity
No data available

Chemical stability
The product is chemically stable under standard ambient conditions (room temperature) .

Possibility of hazardous reactions
Violent reactions possible with: The generally known reaction partners of water.

Conditions to avoid
no information available

Incompatible materials
Strong oxidizing agents

Hazardous decomposition products
In the event of fire: see section 5

11. Toxicological Information

Information on toxicological effects

Mixture

Acute toxicity	No data available
Inhalation	No data available
Dermal	No data available
Skin corrosion/irritation	No data available

Serious eye damage/eye irritation	No data available
Respiratory or skin sensitization	Mixture may cause an allergic skin reaction.
Germ cell mutagenicity	No data available
Carcinogenicity	
IARC:	No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
NTP:	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA:	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.
Reproductive toxicity	No data available

Specific target organ toxicity - single exposure No data available
Specific target organ toxicity - repeated exposure No data available

Aspiration hazard	No data available
Additional Information	Not available

12. Ecological Information

Toxicity

Mixture	No data available
Persistence and degradability	No data available
Bioaccumulative potential	No data available
Mobility in soil	No data available
Results of PBT and vPvB assessment	PBT/vPvB assessment not available as chemical safety assessment not required/not conducted
Other adverse effects	No data available

13. Disposal Considerations

Waste treatment methods

Product

Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself. See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

14. Transport Information

DOT(US)	Not dangerous goods
IMDG	Not dangerous goods
IATA	Not dangerous goods
Further information	Not classified as dangerous in the meaning of transport regulations.

15. Regulatory Information

SARA 302 Components

This material does not contain any components with a section 302 EHS TPQ.

SARA 313 Components

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards

No SARA Hazards

Massachusetts Right To Know Components
No components are subject to the Massachusetts Right to Know Act.

16. Other Information

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Abbreviations and acronyms:
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IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent LD50: Lethal dose, 50 percent

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VB-4005-3 TdT equilibration buffer MSDS

1. Identification of the Substance/Mixture and Company

Product Name	TdT equilibration buffer
Catalog#	VB-4005-3
Product Description	Component
Manufacturer/Supplier	VitroVivo Biotech, LLC. 405 E Gude Dr., Suite 214, Rockville, MD 20850
Tel/fax Number	Phone: 301-500-0499; Toll free: 1-800-260-9817 Fax: 844-248-6208

2. Hazards Identification

CHIP
For Cacodylic Acid, Sodium Salt, Trihydrate: Toxic, Dangerous for the Environment.
For Cobalt Dichloride Hexahydrate: Carcinogen, Category 2.

HCS
For Cacodylic Acid, Sodium Salt, Trihydrate: Toxic, Carcinogen Category 1 (Arsenic Compounds).
For Cobalt Dichloride Hexahydrate: Carcinogen Category 2B

3. Composition/information on ingredients

Mixtures Description: Mixture of the substances listed below.
Composition:

Component	CAS#
Sodium cacodylate, trihydrate	6131-99-3
Cobalt dichloride, hexahydrate	7791-13-1

4. First Aid Measures

EYES: Flush with water for 15 minutes. Seek medical advice if irritation persists.

SKIN: Flush with water, then wash thoroughly with soap and water. Remove contaminated clothing and wash before reuse. Seek medical attention if irritation persists.

INHALATION: Remove the victim from exposure and move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Keep victim quiet and warm. Seek immediate medical attention.

INGESTION: Drink water and seek immediate medical attention. Avoid alcoholic beverages. Never give anything by mouth to an unconscious person.

5. Firefighting Measures

Use media suitable to extinguish the supporting or surrounding fire. Wear NIOSH (or equivalent) approved self contained breathing apparatus. For small fires only: use carbon dioxide, dry powder or foam. Emits toxic fumes under fire conditions.

Flash Point = No data available.

6. Accidental Release Measures

General Information
Wear appropriate personal protective equipment and clothing including lab coat, safety glasses, gloves and NIOSH approved respirator. Collect in a manner that does not create dust and place in a suitable waste container. Avoid contact of material with skin or eyes. Use adequate ventilation

7. Handling and Storage

Handling
Wash thoroughly after handling. Wash thoroughly after handling. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Use with adequate ventilation.

Storage
Store at -20°C away from incompatible material.

8. Exposure Controls/Personal Protection

Wear appropriate personal protective equipment and clothing including lab coat, safety glasses, gloves and NIOSH approved respirator. A qualified industrial hygienist should evaluate the need for respiratory protection. Use respiratory protection approved by NIOSH (or equivalent) and appropriate to the hazard. Avoid contact of material with skin or eyes. Mechanical ventilation or local exhaust as needed to control exposure to dust, vapors or mists. Access to a safety shower and eye-wash.

9. Physical and Chemical Properties

Information on basic physical and chemical properties

Physical State: Liquid
Appearance: clear
Odor: odorless
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: Not available.
Decomposition Temperature: Not available.
Solubility: Soluble.
Specific Gravity/Density: Not available.
Molecular Formula: Solution
Molecular Weight: Not available.

10 Stability and Reactivity

.
Product is stable. Hazardous decomposition products include hydrogen chloride gas, arsenic hydride and oxides of carbon, sodium, cobalt and arsenic. Incompatible with strong oxidizing agents, alkali metals and strong bases. Hazardous polymerization will not occur.

11. Toxicological Information

EFFECTS OF OVEREXPOSURE FOR CACODYLIC ACID, SODIUM SALT, TRIHYDRATE:

EYES:	Contact may cause irritation with itching, burning and watery eyes. May cause conjunctival damage.
SKIN:	May be harmful if absorbed through skin. Contact may cause irritation with redness and pain.
INHALATION:	Toxic if inhaled. May cause irritation of the upper respiratory tract and mucous membranes. May cause pulmonary edema.
INGESTION:	Toxic if swallowed. May cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause liver and kidney damage.
TARGET ORGAN(S):	Kidneys, Liver, Brain, Skin, Bone Marrow, Nervous System, Heart and Lungs.
ADDITIONAL INFORMATION:	May be fatal if swallowed or inhaled. This material contains arsenic which is a known human carcinogen and may be teratogenic based on effects in laboratory animals. Pure Arsenic is listed as toxic by inhalation and if swallowed in the CHIP regulations. The user should note the increased hazards for arsenic compounds and take appropriate precautions. Prolonged exposure to arsenic compounds may cause exfoliation and pigmentations of the skin, inflammation of nerves and nasal septum ulceration. Other symptoms may include dry mouth,

metallic taste, drowsiness, loss of appetite, tremors, convulsions, respiratory arrest, muscle spasms, loss of hair and garlic odor to the breath and perspiration.

Reproductive effects and toxicity data listed in RTECS under CH7890000.
Reproductive effects:
Fertility - post-implantation mortality (e.g. dead/or resorbed implants per total number of implants)(1981).

EFFECTS OF OVEREXPOSURE FOR COBALT DICHLORIDE HEXAHYDRATE:

EYES:	Contact may cause irritation.
SKIN:	Contact may causes irritation. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.
INHALATION:	Causes delayed lung injury. May cause irritation of the upper respiratory tract and mucous membranes. May cause asthmatic attacks due to allergic sensitization of respiratory tract.
INGESTION:	Harmful if swallowed. May cause gastrointestinal irritation, nausea, vomiting & diarrhea.
TARGET ORGAN(S):	Thyroid, Skin, Male Reproductive System, Heart, Kidneys, Pancreas, Blood and Lungs.
ADDITIONAL INFORMATION:	May be harmful if inhaled or absorbed through the skin. Cobalt compounds may cause cancer based on animal studies. May cause blood abnormalities and/or lung damage. Adverse reproductive effects have been reported in animals. Mutagenic effects have occurred in experimental animals.

Reproductive effects, mutation and toxicity data listed in RTECS under GG0200000.

Toxicity data:	Oral Rat LD50 = 766 mg/kg (1982). Toxic effects may include tremor, hypermotility, diarrhea and weight loss or decreased weight gain. Skin Rat LD50 = >2 gm/kg (1998). Details of toxic effects not reported other than lethal dose value.
Carcinogenic data -	IARC Cancer Review: Human Inadequate Evidence (1991). Group 2B - Agent is possibly carcinogenic to humans (1991). ACGIH TLV-TWA - Confirmed animal carcinogen (2007).
Definition(s):	RTECS = Registry of Toxic Effects of Chemical Substances. IARC = International Agency for Research on Cancer.

12. Ecological Information

Toxicity

Toxic to aquatic organisms. May cause long-term adverse effects in aquatic environment

13. Disposal Considerations

Waste treatment methods

General information	When handling waste, the safety precautions applying to handling of the product should be considered.
Disposal methods	Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority.

14. Transport Information

US DOT / IATA: Arsenic compound, liquid, n.o.s. (Sodium cacodylate solution) Class 6.1, UN1556, PG III, Label=Toxic.

15. Regulatory Information

RCRA - No applicable information. SARA 302 - For Cacodylic Acid, Sodium Salt (CAS# 124-65-2): TPQ = 100/10,000 lb; RQ = 100 lbs. SARA 313 - This material contains Cacodylic Acid, Sodium Salt (listed as Arsenic organic compounds), 10.7%, (CAS# 6131-99-3) and Cobalt Dichloride Hexahydrate (listed as Cobalt inorganic compounds), 0.12%, (CAS# 7791-13-1) which are subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373. EPA TSCA Section 8(b) - CAS# 6131-99-3 and 7791-13-1 are not specifically listed on the

TSCA Inventory since they are hydrates. These materials are considered listed if the CAS# for the anhydrous forms appear on the inventory (40CFR720.3(u)(2)). California Proposition 65 - This product is or contains chemical(s) known to the State of California to cause cancer.

16. Other Information

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Abbreviations and acronyms:
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IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent LD50: Lethal dose, 50 percent

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VB-4005-4 TdT enzyme MSDS

1. Identification of the Substance/Mixture and Company

Product Name TdT enzyme
Catalog# VB-4005-4
Product Description Component

Manufacturer/Supplier VitroVivo Biotech, LLC. 405 E Gude Dr., Suite 214, Rockville, MD 20850

Tel/fax Number Phone: 301-500-0499; Toll free: 1-800-260-9817 Fax: 844-248-6208

2. Hazards Identification

Globally Harmonized System of Classification and Labeling of Chemicals (GHS):
Symbol:
Hazard Category: 2A: Serious Eye Damage/Irritation
2: Skin Corrosion/Irritation
2: Carcinogenicity
5: Acute Toxicity
Signal Word: Warning
Hazard Statement: H315+H320: Causes skin and eye irritation.
H303+H313+H333: May be harmful if swallowed, in contact with skin or if inhaled.
H351: Suspected of causing cancer.

GHS Precautionary Statements:
Prevention:
P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P264: Wash hands thoroughly after handling.
P281: Use personal protective equipment as required. Response:
P312: Call a POSION CENTER/doctor/physician if you feel unwell.
P308+P313: If exposed or concerned: Get medical advice/attention.
P302+P352: IF ON SKIN: Wash with plenty of soap and water.
P362: Take off contaminated clothing and wash before reuse.
P305+P351+P388: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Storage: P403+P233: Store in a well ventilated place. Keep container tightly closed.
Disposal: P501: Dispose of content/container in accordance with local regulations.

Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH):
Symbol: Symbol Letter: Xn, Xi
Hazard: Harmful, Irritant
Risk Phrase: R36/38: Irritation to eyes and skin. R40: Limited evidence of a carcinogenic effect.

3. Composition/information on ingredients

Identification of Dangerous Components: This product contains the substances listed below, which are defined as dangerous substances or hazardous chemicals as defined in European Community Directives 67/548/EEC or 1999/45/EC, and Hazard Communication Standard 29 CFR 1910.1200.

Dangerous Component	EINECS	CAS#	Contents	EU Hazard Symbol
Dimethylarsinic	200-883-4	75-60-5	< 2%	N/A
Potassium chloride	231-211-8	7447-40-7	< 1%	N/A
Glycerol	200-289-5	56-81-5	< 40%	N/A

4. First Aid Measures

	Treatment Measures:	Symptoms of Exposure:
Contact with Eyes:	If the product contacts the eyes, promptly wash (irrigate) the eyes with large amounts of tepid	Possible eye irritation, lacrimation, redness, and blurred

	water for at least 15 minutes, occasionally lifting the lower and upper lids. Seek medical attention immediately.	vision.
Ingestion:	Seek medical attention immediately. Never give an unconscious person anything by mouth.	Possible gastrointestinal irritation causing nausea, diarrhea and vomiting.
Inhalation:	If a person inhales large amounts of the product move the exposed person to fresh air at once. If breathing is difficult or stops seek immediate medical attention.	Possible respiratory tract and mucous membrane irritation. If aspirated, may result in lipoid pneumonia.
Skin Contact:	If the product contacts the skin, immediately flush the contaminated skin with mild soap and water. If this chemical penetrates clothing immediately remove the clothing and flush the skin with water. Seek medical attention immediately.	Possible skin irritation and dermatitis after direct, prolonged or repeated skin exposure.

5. Firefighting Measures

Suitable Extinguishing Media: Use extinguishing media appropriate for the surrounding fire. This product is compatible with commercially available extinguishing media.

Special Protective Equipment for Firefighters: This product does not require the use of any additional fire fighting equipment beyond what is appropriate to the surrounding fire.

6. Accidental Release Measures

Personal Precautions: Wear chemical resistant boots, clothing, eye protection, and gloves to prevent skin contact (See Section 8).

Small Spills: Identify the spilled material(s). Barricade the spill area and notify others in the surrounding areas. Control all sources of ignition if the substance is flammable. Don the appropriate personal protective equipment (See section 8). Control the movement of the spilled product (into drains, soil, across floors etc.) with absorbent spill materials. Collect contaminated spill material and place in container meeting appropriate U.N. packaging requirements. Decontaminate used equipment and affected spill area appropriately.

Large Spills: In addition to small spill precautions, determine personnel evacuation distances. Notify appropriate authorities if necessary.

Environmental Precautions: Collect and dispose of contaminated materials according to international, federal, state and local regulations. Keep away from surface and ground water, drains, and soil.

7. Handling and Storage

Handling: Seek appropriate training to safely handle this product under normal conditions. Use the recommended personal protective equipment (See Section 8) to prevent chemical exposures. Wash hands with soap and water before eating, drinking, or touching common items (phone, computer, etc.) to prevent cross contamination. Use this product with adequate ventilation. See product technical data sheet for details.

Storage: See product technical data sheet for details.

Specific use: See product technical data sheet for details.

8. Exposure Controls/Personal Protection

Exposure Limit Values:	OSHA PEL	NIOSH REL	ACGIH TLV	Other
Glycerol:	TWA 15 mg/m3	Not Listed	TWA 10 mg/m3	See Below
Belgium:	TWA 10 mg/m3 , MAR2002			
Finland:	TWA 20 mg/m3 , JAN1999			
France:	VME 10 mg/m3 , FEB2006			
Korea:	TWA 10 mg/m3 (mist), 2006			
Mexico:	TWA 10 mg/m3 (inhalable), 2004			
The Netherlands:	MAC-TGG 10 mg/m3 , 2003			
New Zealand:	TWA 10 mg/m3 (mist), JAN2002			
Switzerland:	MAK- week 50 mg/m3 ,KZG- week 100 mg/m3 , DEC2006			
United Kingdom:	TWA 10 mg/m3 , 2005			
Dimethylarsinic Acid:	Not Listed	Not Listed	Not Listed	None
Potassium Chloride:	Not Listed	Not Listed	Not Listed	See Below
Russia:	STEL 5 mg/m3 , JUN2003			

	Normal Handling Conditions	**Emergency Response Conditions**
Engineering Controls:	General room ventilation is adequate for the use of this product.	Provide negative pressure ventilation
Respiratory Protection:	Use appropriate respiratory protection.	Use appropriate respiratory protection.
Eye Protection:	Safety glasses with side shields.	Chemical splash goggles or other face protection as appropriate.
Skin Protection:	Laboratory coat, adequate chemical -resistant gloves.	Chemically resistant boots, clothes, and impermeable gloves as appropriate.
Environmental Exposure Controls:	Not Available.	Not Available.

Other Equipment: Safety shower, eyewash stations, and hand washing equipment should be available close to the work area as needed.

9. Physical and Chemical Properties

Information on basic physical and chemical properties

Physical State: Liquid
Appearance: clear, colorless
Odor: Rotten Egg Odor
pH: 7.0
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: Not available.
Decomposition Temperature: Not available.
Solubility: Soluble.
Specific Gravity/Density: Not available.
Molecular Formula: Solution
Molecular Weight: Not available.

10 Stability and Reactivity

Chemical Stability: Product is stable under normal operating conditions and use as described in the product technical data sheet.

Conditions to Avoid: See product technical data sheet for details.

Incompatible Materials to Avoid: Strong acids or bases, strong oxidizers, and extreme temperatures.

Hazardous Decomposition Products: Heating to decomposition temperature may produce carbon monoxide, carbon dioxide, nitrogen oxides.

11. Toxicological Information

Toxicology Data: Toxicological information for this product as a whole does not exist, below is data for the individual components.
Glycerol: RTECS #MA8050000
Dimethylarsinic Acid: RTECS #CH7525000
Potassium Chloride: RTECS #TS8050000

	Toxicity Test	Exposure Route	Dose	Observed Effect
Acute Toxicity:				
Glycerol:	Lowest Published Toxic Dose (Human)	Oral	1,428 mg/kg	N/A
	LD50 (Rat)	Oral	12,600 mg/kg	Behavioral: General anesthetic Behavioral: Muscle weakness Liver: Other changes
Dimethylarsinic Acid:	LD50 (Rat)	Oral	644 mg/kg	N/A
	LD50 (Mouse)	Oral	1,200 mg/kg	N/A
	LCLO (Rat)	Inhalation	>2,600 mg/m3 /2H	N/A
Potassium Chloride:	LD50 (Rat)	Oral	2,600 mg/kg	N/A
	LD50 (Rat)	Intravenous	142 mg/kg	Behavioral: Convulsions or effect on seizure threshold Lung, Thorax, or Respiration: Dyspnea
Skin Corrosion/Irritation:				
Glycerol:	Skin Irritation (Rabbit)	Skin	500 mg/24 hour	Mild
Serious Eye Damage/Eye Irritation:				
Glycerol:	Eye Irritation (Rabbit)	Eye	500 mg/24 hour	Mild
Potassium Chloride:	Eye Irritation (Rabbit)	Eye	500 mg/24 hour	Mild

Respiratory or Skin Sensitization: Not Available
Germ Cell Mutagenicity: Not Available
Reproductive Toxicity: Not Available
STOST-Single Exposure: Not Available
STOST-Repeated Exposure: Not Available
Aspiration Hazard: Not Available
Carcinogenicity: Carcinogenetic information for this product as a whole does not exist, below is data for the individual components.

Research Agency:	OSHA:	NTP:	IARC:
Glycerol:	Not Listed	Not Listed	Not Listed
Dimethylarsinic Acid:	Not Listed	Not Listed	2B
Potassium Chloride:	Not Listed	Not Listed	Not Listed

12. Ecological Information

Ecotoxicity: Ecotoxicity information for this product as a whole does not exist, below is data for the individual components.
Glycerol: LC50 Carassius Auratus 24 Hours 5,000,000 ug/L4

	LC50 Leuciscus Idus Melanotus 48 Hours 10,000,000 ug/L5 LC50 Oncorhynchus Mykiss 96 Hours 54.0 ml/L6
Dimethylarsinic Acid:	LC50 Lepomis Macrochirus 24 Hours 21,000 ug/L7 LC50 Lepomis Macrochirus 96 Hours 100,000 ug/L8 LC50 Oncorhynchus Mykiss 96 Hours 152,000 ug/L8
Potassium Chloride:	LC50 Gambusia Affinis 24 Hours 4,700,000 ug/L9 LC50 Gambusia Affinis 48 Hours 1,990,000 ug/L9 LC50 Gambusia Affinis 96 Hours 435,000 ug/L9

Mobility:

Glycerol:

Terrestrial Fate: If released to soil, glycerin is expected to undergo rapid biodegradation under aerobic conditions. Biodegradation under anaerobic conditions is also expected to occur. Based on an experimental log octanol/water partition coefficient of -1.76 and its water solubility, 1,220,000 mg/l at 5°C, soil adsorption coefficients for glycerin can be estimated at 3 and 2, respectively, using regression-derived equations. The magnitude of these values indicate that glycerin will display very high mobility in soil. Based on an estimated Henry's Law constant of 1.75X10+11 atm cu-m/mol and vapor pressure, 1.58X10-4 mm Hg at 25°C glycerin is not expected to significantly volatilize from wither moist or dry soil to the atmosphere.

Aquatic Fate: If released to water, glycerin is expected to rapidly degrade under aerobic conditions. Degradation is also likely in seawater and under anaerobic conditions. Based on an experimental log octanol/water partition coefficient of -1.76 and its water solubility, 1,220,000 mg/l at 5°C, bioconcentration factors for glycerin can be estimated at 3 and 0.2, respectively, using regression-derived equations. The magnitude of these values indicate that bioconcentration in fish and aquatic organisms is not likely to occur to a significant extent. Estimated soil adsorption coefficients of 2 and 3 indicated that adsorption to sediment and suspended organic matter will not be important. Based on an estimated Henry's Law constant of 1.75X10+11 atm cu-m/mol, volatilization of glycerin from water will be slower then for water itself.

Atmospheric Fate: If released to the atmosphere, glycerin may undergo a gas phase oxidation with photochemically produced hydroxyl radicals. An estimated rate constant for this reaction of 1.7X10-11 cu- cm/molec-sec at 25°C translates to an atmospheric half-life of 33 hrs using an average atmospheric hydroxyl radical concentration of 5X10+5 molec/cu-cm. The water solubility of glycerin, 1,220,000 mg/l at 5°C, indicates that it may also undergo atmospheric removal by wet deposition processes.

Persistence and Degradation:

Glycerol:

When incubated with a filtered effluent from a sanitary waste treatment plant, glycerin displayed a 5 day BOD of 82%. Inoculation of glycerin with activated sewage sludge resulted in 43.5-52.9% 5 day BOD. Glycerin underwent 94-97% removal after 24 hrs when incubated with activated sludge from a waste water treatment plant. A 98.7% COD was observed in 120 hrs after inoculation with a adapted activated sludge seed. Incubation with an activated sludge seed gave a 5 day BOD of 68%. Inscreening studies, 5 day BODs for glycerin of 31%, 52% using activated sludge, 78.3 using domestic sludge, and 24.4% using seawater were observed. Glycerin is listed as a substance easily degraded in a sewage treatment plant.

An estimated rate constant for the vapor-phase reactio of glycerin with photochemically produced hydroxyl radicals of 1.7X10-11 cu cm/molec-sec at 25°C translates to an atmospheric half-life of 33 hr using an average atmospheric hydroxyl radical concentration of 5X10-5 molec/cu cm.

Bio Accumulative Potential:

Glycerol:

Based on an experimental log octanol/water partition coefficient of -1.76 and its water solubility, 1,220,000 mg/l at 5°C, bioconcentration factors for glycerin can be estimated at 3 and 0.2, respectively, using regression-derived equations.

The magnitude of these values indicate that bioconcentration of glycerin in fish and aquatic organisms will not be significant.

Results of PBT Assessment: Not Available.
Other Adverse Effects: None Known.

13. Disposal Considerations

Substance: Dispose of unused contents in accordance with international, federal, state, and local regulations.

Contaminated Packaging: Dispose of container in accordance with international, federal, state and local requirements.

14. Transport Information

UN Number: Not Listed.
Class: Not Listed.
Proper Shipping Name: Not Listed.
Packing Group: Not Listed.
Marine Pollutant: Not Listed.
Other Applicable Information: None.

15. Regulatory Information

Australia:	Hazchem Code:	Not Listed.
	Poisons Schedule Number:	Not Listed.
California:	Proposition 65 Listed:	Dimethylarsinic Acid.
Canada:	WHMIS:	D2A, D2B.
European Union:	REACH:	Chemical Safety Assessment for the substance or substances in the preparation not required.
	Substances of Very High Concern (SVHC) - January 13, 2010:	This product does not contain SVHC's in concentrations above 0.1% weight/weight.
	Category of Danger:	Xi: Irritant. Xn: Harmful.
	Risk Phrases:	R36/38: Irritating to eyes and skin. R40: Limited evidence of a carcinogenic effect.
	Safety Phrases:	S7/9: Keep container tightly closed and in a well-ventilated place. S20/21: When using do not eat, drink or smoke. S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S27/28: After contact with skin, take off immediately all contaminated clothing, and wash immediately with plenty of soap and tepid water. S29/35: Do not empty into drains; dispose of this material and its container in a safe way. S36/37/39: Wear suitable protective clothing, gloves and eye/face protection. S45: In case of accident or if you feel unwell, seek medical advice immediately.
	OECD/High Production Volume (HPV) Chemicals:	Glycerol, Potassium Chloride and Water.

	RoHS:	This product does not contain RoHS listed substances in concentrations above the established thresholds.
Japan:	Poisonous and Deleterious Substances Control Law:	Not listed

16. Other Information

This information contained herein is believed to be accurate but is not warranted to be so. Data and calculations are based on information furnished by the manufacturer of the product and manufacturers of the components of the product. Users are advised to confirm in advance of need that information is current, applicable and suited to the circumstances of use. Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Furthermore, vendor assumes no responsibility for injury caused by abnormal use of the material even if reasonable safety procedures are followed. Any questions regarding this product should be directed to the manufacturer of the product as described in Section 1.

Abbreviations and acronyms:
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent LD50: Lethal dose, 50 percent

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VB-4005-5 Biotinylated dUTP MSDS

1. Identification of the Substance/Mixture and Company

Product Name	Biotinylated dUTP
Catalog#	VB-4005-5
Product Description	Component
Manufacturer/Supplier	VitroVivo Biotech, LLC. 405 E Gude Dr., Suite 214, Rockville, MD 20850
Tel/fax Number	Phone: 301-500-0499; Toll free: 1-800-260-9817 Fax: 844-248-6208

2. Hazards Identification

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)
Not a hazardous substance or mixture.

GHS label elements
Not a hazardous substance or mixture.

Other hazards
None known.

3. Composition/information on ingredients

Mixtures Description: Mixture of the substances listed below.
Composition:

Component	CAS#
Biotinylated dUTP	136632-31-0

4. First Aid Measures

General advice : Do not leave the victim unattended.

If inhaled :
Move to fresh air.
If unconscious, place in recovery position and seek medical advice.
If symptoms persist, call a physician.

In case of skin contact : If on skin, rinse well with water.

In case of eye contact :
Immediately flush eye(s) with plenty of water.
Remove contact lenses.
Protect unharmed eye.
If eye irritation persists, consult a specialist.

If swallowed :
Keep respiratory tract clear.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
Rinse mouth with water.

Most important symptoms and effects, both acute and delayed : None known.

Notes to physician : The first aid procedure should be established in consultation with the doctor responsible for industrial medicine.

5. Firefighting Measures

Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Specific hazards during fire fighting :	No information available.
Hazardous combustion products :	No hazardous combustion products are known
Further information :	Standard procedure for chemical fires. Use extinguishing measures that are appropriate to local cir cumstances and the surrounding environment.

Special protective equipment for fire-fighters : Wear self-contained breathing apparatus for firefighting if necessary.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures :	Refer to protective measures listed in sections 7 and 8.
Environmental precautions :	Local authorities should be advised if significant spillages cannot be contained.
Methods and materials for containment and cleaning up :	Wipe up with absorbent material (e.g. cloth, fleece). Keep in suitable, closed containers for disposal.

7. Handling and Storage

Advice on protection against : fire and explosion	Normal measures for preventive fire protection.
Advice on safe handling :	For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area.
Conditions for safe storage :	Electrical installations / working materials must comply with the technological safety standards.
Further information on storage conditions :	See label, package insert or internal guidelines
Materials to avoid :	No materials to be especially mentioned.
Further information on storage stability :	No decomposition if stored and applied as directed

8. Exposure Controls/Personal Protection

Ingredients with workplace control parameters
Contains no substances with occupational exposure limit values.

Engineering measures :	No data available
Personal protective equipment **Respiratory protection :**	No personal respiratory protective equipment normally required.
Hand protection **Material :**	In case of contact through splashing: Nitrile rubber Break through time : > 30 min Glove thickness : > 0.11 mm In case of full contact:
Material :	butyl-rubber Break through time : > 480 min Glove thickness : > 0.4 mm
Remarks :	Wear appropriate protective gloves to prevent skin contact. Replace torn or punctured gloves promptly.
Eye protection :	Safety glasses
Skin and body protection :	Protective suit

Hygiene measures :	Handle in accordance with good industrial hygiene and safety practice.

9. Physical and Chemical Properties

Information on basic physical and chemical properties

Physical State: Liquid
Appearance: clear, colorless
Odor: none
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: Not available.
Decomposition Temperature: Not available.
Solubility: Soluble.
Specific Gravity/Density: Not available.
Molecular Formula: Solution
Molecular Weight: Not available.

10 Stability and Reactivity

Reactivity :	No dangerous reaction known under conditions of normal use.
Chemical stability :	Stable under normal conditions.
Possibility of hazardous reactions :	No dangerous reaction known under conditions of normal use. Stable under recommended storage conditions. No hazards to be specially mentioned.
Conditions to avoid :	Exposure to light.
Incompatible materials :	Strong oxidizing agents
Hazardous decomposition products :	No decomposition if stored and applied as directed.

11. Toxicological Information

Acute toxicity
Not classified based on available information.

Skin corrosion/irritation
Not classified based on available information.

Serious eye damage/eye irritation
Not classified based on available information.

Respiratory or skin sensitization
Skin sensitization
Not classified based on available information.

Respiratory sensitization
Not classified based on available information.

Germ cell mutagenicity
Not classified based on available information.

Carcinogenicity
Not classified based on available information.

IARC	No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
OSHA	No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.
NTP	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity
Not classified based on available information.

STOT-single exposure
Not classified based on available information.

STOT-repeated exposure
Not classified based on available information.

Aspiration toxicity
Not classified based on available information.

12. Ecological Information

Ecotoxicity
No data available

Persistence and degradability
No data available

Bioaccumulative potential
No data available

Mobility in soil
No data available

Other adverse effects

Product: Ozone-Depletion Potential :	Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances Remarks: This product neither contains, nor was manufac tured with a **Class I** or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

13. Disposal Considerations

Disposal methods

Waste from residues :	Can be disposed as waste water, when in compliance with local regulations.
Contaminated packaging :	Empty containers should be taken to an approved waste handling site for recycling or disposal. Do not re-use empty containers.

14. Transport Information

International Regulations
UNRTDG
Not regulated as a dangerous good

IATA-DGR
Not regulated as a dangerous good

IMDG-Code
Not regulated as a dangerous good

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not applicable

Domestic regulation
49 CFR
Not regulated as a dangerous good

Special precautions for user
Remarks : Not dangerous goods in the meaning of ADR/RID, ADN, IMDG-Code, ICAO/IATA-DGR

15. Regulatory Information

CERCLA Reportable Quantity
This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity
This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity
This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : No SARA Hazards
SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Air Act
This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act
This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.
This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.
This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307.
This product does not contain any priority pollutants related to the U.S. Clean Water Act.

US State Regulations
Massachusetts Right To Know
No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know
Water

Maine Chemicals of High Concern
Product does not contain any listed chemicals

Vermont Chemicals of High Concern
Product does not contain any listed chemicals

Washington Chemicals of High Concern
Product does not contain any listed chemicals

The ingredients of this product are reported in the following inventories:
AIIC : Not in compliance with the inventory
DSL : This product contains the following components that are not on the

	Canadian DSL nor NDSL. Biotin-16-dUTP, tetralithium salt
NZIoC :	On the inventory, or in compliance with the inventory
ENCS :	Not in compliance with the inventory
ISHL :	Not in compliance with the inventory
KECI :	Not in compliance with the inventory
PICCS :	Not in compliance with the inventory
IECSC :	Not in compliance with the inventory
TCSI :	Not in compliance with the inventory
TSCA :	Product contains substance(s) not listed on TSCA inventory.
TECI :	Not in compliance with the inventory

TSCA list
No substances are subject to a Significant New Use Rule.
No substances are subject to TSCA 12(b) export notification requirements.

16. Other Information

This information contained herein is believed to be accurate but is not warranted to be so. Data and calculations are based on information furnished by the manufacturer of the product and manufacturers of the components of the product. Users are advised to confirm in advance of need that information is current, applicable and suited to the circumstances of use. Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Furthermore, vendor assumes no responsibility for injury caused by abnormal use of the material even if reasonable safety procedures are followed. Any questions regarding this product should be directed to the manufacturer of the product as described in Section 1.

Abbreviations and acronyms:
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent LD50: Lethal dose, 50 percent

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VB-4005-6 TUNEL positive FFPE slides MSDS

1. Identification of the Substance/Mixture and Company

Product Name	TUNEL positive FFPE slides
Catalog#	VB-4005-6
Product Description	Component
Manufacturer/Supplier	VitroVivo Biotech, LLC. 405 E Gude Dr., Suite 214, Rockville, MD 20850
Tel/fax Number	Phone: 301-500-0499; Toll free: 1-800-260-9817 Fax: 844-248-6208

2. Hazards Identification

GHS-Classification
Signal Word
Not Hazardous

Health Hazard
Not Hazardous

Physical Hazards
Not Hazardous

Principle Routes of Exposure/Potential Health Effects

Eyes	May be harmful if exposed to eyes. May cause eye irritation, watering eyes, stinging or burning sensation.
Skin	May be harmful if exposed to skin. May cause skin irritation, itching, redness or inflammation.
Inhalation	May be harmful if inhaled. May cause respiratory tract irritation, headache, dizziness, nausea or coughing.
Ingestion	May be harmful if swallowed. May cause irritation of gastrointestinal tract, nausea, or vomiting.

Specific Effects

Carcinogenic Effects	None
Mutagenic Effects	None
Reproductive Toxicity	None
Sensitization	None
Target Organ Effects	No known effects under normal use conditions.

WHMIS

Health	0
Flammability	0
Reactivity	0

3. Composition/information on ingredients

The product contains no substances which at their given concentration, are considered to be hazardous to health. We recommend handling all chemicals with caution.

4. First Aid Measures

Eye Contact	Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
Skin Contact	Wash off with soap and plenty of water. Consult a physician.
Inhalation	If breathed in, move person into fresh air. If not breathing give artificial respiration Consult a physician.

Ingestion	Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. Firefighting Measures

Suitable Extinguishing Media	Use water spray, alcohol- resistant foam, dry chemical or carbon dioxide.
Special Protective	Wear self-contained breathing apparatus and protective clothing to prevent contact with eyes and skin.
Equipment for Fire-fighters	
Unusual Fire	N/A
Explosions Hazard(s)	N/A
Flash Point	N/A
Autoignition Temp	N/A
Flammability	N/A

6. Accidental Release Measures

Personal Precautions	Exercise appropriate precautions to minimize direct contact with skin or eyes and prevent inhalation of vapors. Wear disposable coveralls and discard them after use.
Methods for Cleaning-up	Soak up with inert absorbing materials and place in a closed container for disposal. Ventilate area and wash spill site after material pickup is complete.
Environmental Precautions	Prevent further leakage or spillage if safe to do so. See Section 12 for additional information.

7. Handling and Storage

Handling	Always wear recommended Personal Protective Equipment. Avoid contact with eyes, skin and clothing. Do not ingest. Wash hands thoroughly after use.
Storage	Keep cap tightly closed. Keep container in a cool, well-ventilated area.

8. Exposure Controls/Personal Protection

Exposure Limits
No known exposure limits.

Engineering Measures
Ensure adequate ventilation, especially in confined areas.

Personal Protective Equipment
Personal Protective Equipment Person protective Equipment requirements are dependent of the user institution's risk assessment, and are specific to the risk assessment for each laboratory where this material may be used.

Respiratory Protection	Wear Suitable respiratory equipment if ventilation is insufficient.
Hand	Compatible chemical-resistant gloves.
Eye	Compatible safety goggles.
Skin and Body Protection	Lightweight protective clothing.
Hygiene Measures	Handle in accordance with good industrial hygiene and safety practice.

Environmental Exposure Controls
No special environmental precautions required.

9. Physical and Chemical Properties

Information on basic physical and chemical properties

Physical State: Solid
Appearance: clear
Odor: odorless
pH: Not available.
Vapor Pressure: Not available.
Vapor Density: Not available.
Evaporation Rate: Not available.
Viscosity: Not available.
Boiling Point: Not available.
Freezing/Melting Point: Not available.
Decomposition Temperature: Not available.
Solubility: Soluble.
Specific Gravity/Density: Not available.
Molecular Formula: Not available.
Molecular Weight: Not available.

10 Stability and Reactivity

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General Physical Properties

Stability	Stable under recommended storage conditions.
Materials to Avoid	No information available
Hazardous Decomposition	No information available
Hazardous Polymerization	Does not occur

11. Toxicological Information

Acute Toxicity
Not Hazardous

Principle Route of Exposure/Potential Health Effects

Eye	No information available
Skin	No information available
Inhalation	No information available
Ingestion	No information available
Carcinogenic Effects	None
Mutagenic Effects	No information available
Reproductive Toxicity	No information available
Sensitization	No information available
Target Organ Effects	No known effects under normal use conditions.

12. Ecological Information

Ecotoxicity Effects	No information available
Mobility	No information available.
Biodegradation	Inherently biodegradable.
Bioaccumulation	Does not bioaccumulate.

13. Disposal Considerations

Dispose of in accordance with local regulations.

14. Transport Information

IATA

Proper Shipping	Not classified as dangerous under the transport regulations.
Name Hazard Class	None
Subsidiary Class	None
Packing Group	None
Un-No	None

15. Regulatory Information

U.S. Federal Regulations
SARA 313
Not Regulated by SARA.

Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs)
Contains no HAPs.

U.S. State Regulations
California Proposition 65
Contains no chemical listed under Proposition 65.

Canadian Regulations
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by CPR.

WHMIS Hazard Class
Not controlled.

This product has been classified according to the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

16. Other Information

This information contained herein is believed to be accurate but is not warranted to be so. Data and calculations are based on information furnished by the manufacturer of the product and manufacturers of the components of the product. Users are advised to confirm in advance of need that information is current, applicable and suited to the circumstances of use. Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Furthermore, vendor assumes no responsibility for injury caused by abnormal use of the material even if reasonable safety procedures are followed. Any questions regarding this product should be directed to the manufacturer of the product as described in Section 1.

Abbreviations and acronyms:
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent LD50: Lethal dose, 50 percent

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