



Section 1: Product and Company Identification

Product Name: Verikine™ IFN ELISA kits (containing Thimerosal preservative) Document Number: MSDS4000 Rev.03
Effective Date: 11/8/13

Manufacturer: PBL Assay Science
131 Ethel Road West, Suite 6
Piscataway, NJ 08854 USA
Tel: 732.777.9123, Facsimile: 732.777.9141

This MSDS is applicable to the following products:

| Catalog No. | Product Name |
|----------------------|--|
| 41500 | Verikine™ Human Interferon Gamma ELISA Kit |
| 42500 (Discontinued) | Verikine™ Mouse Interferon Gamma ELISA Kit |

Note: To the best of our knowledge, at the supplied concentrations stated below, the products do not pose a hazard equivalent to the hazard posed by the individual ingredients in their pure form and have thereby classified each in its entirety as non-hazardous.

In compliance with CFR 29 1910.1200(g) 2(i) (C) (3), all ingredients that may present minor physical hazards while in the mixture have been listed.

It is recommended to the user to follow Sections 4 to 7 in event of an emergency and for proper handling and storage instructions. The user should refer to Section 8 with regard to appropriate protective equipment.

Section 2: Composition / Information on Ingredient

| Component | Composition |
|---------------------------|--|
| Coated Plates | < 0.1 % Thimerosal |
| Wash Concentrate | < 0.1 % v/v Thimerosal |
| IFN standard | < 1 % w/v Bovine Serum Albumin (BSA); < 0.1 % v/v Thimerosal |
| Dilution Buffer | < 1 % w/v BSA; < 0.1 % v/v Thimerosal |
| Antibody Concentrate | < 0.1 % v/v Thimerosal |
| HRP Conjugate Concentrate | None |
| HRP Concentrate Diluent | < 1 % w/v BSA; < 0.1 % v/v Thimerosal |
| TMB Substrate solution | <0.1 % v/v Tetramethylbenzidine Dihydrochloride |
| TMB STOP Solution | < 2% v/v Hydrochloric Acid; < 2% v/v Sulfuric Acid |

1) Thimerosal

- Molecular Formula: 2-(C₂H₅HgS) C₆H₄CO₂Na
- CAS Number: 54-64-8
- EC Number: 200-210-4
- Symbol: T+, N
- R-Phrases: R26/27/28, R33, R50/53

2) TMB Dihydrochloride

- 3,3',5',5' Tetramethylbenzidine Dihydrochloride
- Molecular Formula: $C_{16}H_{20}N_2 \cdot 2HCl \cdot H_2O$
- CAS Number: 64285-73-0
- EC Number: 264-769-6
- Symbol: Xn
- R-Phrases: R20/21/22, R40

3) H: STOP Solution

- | | | |
|----------------------|----------------------|------------------|
| • Ingredient: | a) Hydrochloric Acid | b) Sulfuric Acid |
| • Molecular formula: | a) HCL | b) H_2SO_4 |
| • Synonym: | a) Muriatic acid | b) none |
| • CAS Number: | a) 7647-01-0 | b) 7664-93-9 |
| • EC Number: | a) 231-595-7 | b) 231-639-5 |
| • Symbol: | a) C | b) C |
| • R-Phrases: | a) R34, R37 | b) R35 |

4) BSA

- Ingredient: Serum Albumin
- CAS Number: 9048-46-8
- EC Number: 232-936-2
- R-phrase: No information required

Section 3: Hazards Identification

Emergency Overview

1) Thimerosal

Note: Information on toxicity at the supplied concentration of Thimerosal 0.01% v/v is unavailable. The following information pertains to pure Thimerosal in powder form.

Highly Toxic (USA), Very Toxic (EU)

- Very toxic by inhalation, contact with skin, and if swallowed. There is a danger of cumulative effects. It may cause sensitization by inhalation and skin contact. Thimerosal is irritating to eyes, respiratory system and skin.

2) TMB dihydrochloride

- Avoid contact and inhalation.

3) STOP Solution

Ingredients: a) <2%v/v Hydrochloric acid, b) <2%v/v Sulfuric acid

- Harmful by inhalation
- Causes skin and eye burns
- Harmful if swallowed

Refer to **Section 11** for further toxicological information.

4) BSA



- Mild irritant to the mucous membrane, respiratory tract
- Can cause allergic reactions to users with an allergy to dairy products.

Section 4: Symptoms and First Aid Measures

Symptoms:

- *Inhalation:* Lung irritants.
- *Skin Contact:* May be skin irritants and non-sensitizers. Skin inflammation is characterized by itching, reddening, and occasional blistering.
- *Eye Contact:* Eye irritants.
- *Ingestion:* Can cause nausea and vomiting.

First Aid Measures:

- *Ingestion / Oral exposure:* If the person is conscious wash mouth with water. If large quantity of any component is swallowed call a physician immediately. Loosen any tight clothing.
- *Inhalation:* If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms persist or reappear.
- *Skin Contact:* If large quantity of any component is in contact with the skin, wash with ample amounts of soap and water for at least 15 minutes. Cover the skin with an emollient. Get medical attention if irritation develops. Cold water may be used.
- *Eye Contact:* Check for and remove any contact lenses. Immediately flush eyes with ample amounts of water for at least 15 minutes. Cold water may be used. Get medical attention if irritation occurs.

Section 5: Fire Fighting Measures

- *Flammability of Product:* May be combustible at extreme temperatures.
- *Flash Points:* Not available for the provided concentrations.
- *Fire Hazards in presence of Various Substances:* Not available
- *Fire Fighting Media:* Small Fire: Use DRY chemical powder. Large fire: Use water spray, fog or foam. Do not use water jet.
- *Protective Clothing (Fire):* Use an approved/certified respirator or equivalent. Use protective clothing to avoid contact with skin and eyes.
- *Special Remarks on Fire Hazards:* Not available
- *Hazardous thermal decomposition products:* STOP solution: Hydrogen chloride, hydrogen gas, oxides of sulfur, chlorine. BSA: Toxic fumes.

Section 6: Accidental Release Measures

- *Procedures of Personal Precautions:* Wear safety glasses, lab coat and use an approved certified respirator or equivalent. Must wear Gloves.
- *Small Spill and Leak:* Use appropriate tools to put the spilled solid in a waste disposal container. Finish cleaning by water on the contaminated surface and dispose of according to local and regional authority requirements.
- *Environmental Precautions and Clean-up Methods:* Use a shovel to put the material into a waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow the water to evacuate through the sanitary system.

Section 7: Handling and Storage



- **Handling:** Avoid breathing vapors, contact with skin or ingestion. Wear a fully-buttoned lab coat and gloves while working with the product.
- **Storage:** Keep all containers tightly closed in a cool and well-ventilated area. Refer to the storage temperatures indicated in the protocol. It is recommended to use original containers for storage. Do not wash out container and use it for other purposes.
- **Intended Use:** Refer to the protocol supplied for proper use. If questions arise please contact technical support techservice@pbl assaysci.com.
- **Packaging materials:** Use original containers.

Section 8: Exposure Controls/Personal Protection

- Engineering Controls
 - Safety Shower
 - Eye Wash
- Personal Protective Equipment
 - Lab Coat
 - Gloves
 - Safety Glasses (recommended)
- Exposure Limits:
 - 1) Thimerosal
 - USA: OSHA-0.01 mg/m³ TWA for 8 H
 - Sweden: 0.05 mg (Hg) /m³ TWA for 8 H
 - Denmark: 0.05 mg (Hg)/m³ TWA for 8 H
 - Norway: N/A
 - France: N/A
 - Netherlands: 0.05 mg (Hg)/m³ TWA for 8 H
 - Germany: 0.1 mg (Hg)/m³ TWA for 8 H
 - 2) TMB Substrate Solution
 - 3', 3'-5', 5' Tetramethylbenzidine dihydrochloride
 - OSHA PEL-Not Established
 - ACGIH TLV: Not Established
 - 3) TMB Stop Buffer
 - Sulfuric Acid
 - OSHA PEL- 1 mg/m³ TWA for 8 H
 - ACGIH TLV-1 mg/m³ TWA for 8 H
 - Hydrochloric Acid
 - OSHA PEL-7.5 mg/m³ TWA for 8 H
 - ACHGIH TLV-7.5 mg/m³ TWA for 8 H
 - 4) BSA
 - OSHA PEL- Not Established
 - ACGIH TLV- Not Established

Section 9: Physical and Chemical Properties

- Physical State and Appearance: All components besides the plates are in liquid state.



- Dispersion properties: Not available
- Solubility: Not applicable
- Odor: Odorless
- Taste: Not available
- Color: Colorless. The color of the liquid components may vary with time or change in pH.

Section 10: Stability and Reactivity

- Stability and Reactivity: All components are stable at recommended storage conditions. TMB Stop buffer can react with metals and strong bases.
- Conditions to Avoid: Extreme temperatures.
- Materials to Avoid: Avoid contact of metals and strong bases with the TMB Stop Buffer. Hazardous Decomposition Products:
 - Reaction of TMB Stop buffer with metals and strong bases: Hydrogen chloride, Chlorine, Hydrogen Gas, and Oxides of Sulfur.
 - Combustion of BSA may emit toxic fumes.
 - There are no hazardous decomposition products for the remaining components of the kit.
- Hazardous Polymerization: Will not occur

Section 11: Toxicological Information

1) Thimerosal

This information is based on data on pure Thimerosal. At the supplied concentration Thimerosal 0.01 % v/v, the toxicological information has not been established.

| LD50 | Rat | Mouse |
|---------------|----------|----------|
| Oral: | 75 mg/kg | 91 mg/kg |
| Subcutaneous: | 98 mg/kg | 66 mg/kg |

Chronic effects on Humans: Mutagen

Other toxic effects on Humans: Eye irritant, Lung irritant, Skin irritant.

Special remarks on Chronic Effects on Humans: Not Available

Special remarks on Other Toxic effects on Humans: Nausea, Vomiting, Ataxia.

Special remarks on toxicity to Animals: Effects Kidney, Ureter, and Bladder. Thimerosal can cause acute renal failure and acute tubular necrosis. Affects fertility in Rats and is classified as a carcinogen by tests on Rats.

2) TMB dihydrochloride

LD50: Not available

Chronic effects on Humans: None known

Other toxic effects on Humans: Possible irritant to eyes, mucous membrane and respiratory track.

Special Remarks on Chronic Effects on Humans: None

Special Remarks on other Toxic Effects on Humans: None

Special remarks on toxicity to Animals: Not available

3) Stop Solution

This information is based on data on pure Sulfuric Acid (95-98 % v/v) and pure Hydrochloric Acid (95-98 % v/v). At the supplied concentration (< 2 % v/v), the toxicological information has not been established. It is recommended that safety goggles, gloves and a lab coat must be worn while working with STOP solution.



| | | |
|-------|------------------------|-------------------------|
| LD50: | Sulfuric Acid (Rabbit) | Hydrochloric Acid (Rat) |
| Oral: | 900 mg/kg | 2140 mg/kg |

Chronic effects on Humans: Sulfuric Acid-Carcinogen (Group 1), Hydrochloric Acid- Group 3 Carcinogen.
Other toxic effects on Humans: Causes severe burns to eyes, mucous membrane and respiratory track. Very toxic if swallowed. Causes skin burns on contact.
Special Remarks on Chronic Effects on Humans: None
Special Remarks on other Toxic Effects on Humans: None
Special Remarks on toxicity to Animals: None

4) BSA

LD50: Not available

Chronic effects on Humans: None known

Other toxic effects on Humans: Possible mild irritant to eyes, mucous membrane and respiratory track.

Special Remarks on Chronic Effects on Humans: None

Special remarks on toxicity to Animals: Not available

Special Remarks on other Toxic Effects on Humans: **BSA may be an allergen to users with an allergy to dairy products. Handle the product with appropriate personal protection gear if there is a known allergy to dairy products.**

Section 12: Ecological Information

- No information available.

Section 13: Disposal Considerations

- For every component, waste must be disposed according to federal, state and local environment control regulations. Contact a licensed professional waste disposal service to dispose components containing < 0.01 % Thimerosal.

Section 14: Transport Information

- DOT Proper Shipping Name: None
- The kit is transported as Non-Hazardous. All products and materials are transported at storage conditions mentioned in the protocol.

Section 15: Regulatory Information

Regulatory information on the components at their supplied concentrations is not available. Please refer below for definitions of applicable risk phrases to pure form of hazardous components. Risk phrases at supplied concentrations not available.

Risk Phrases:

- 20 Harmful by inhalation
- 21 Harmful in contact with skin
- 22 Harmful if swallowed
- 26 Very toxic by inhalation
- 27 Very toxic in contact with skin
- 28 Very toxic if swallowed



- 33 Danger of cumulative effects
- 34 Causes burns
- 35 Causes severe burns
- 37 Irritating to the respiratory system
- 40 Possible risk of cancer
- 50 Very toxic to aquatic organisms
- 53 May cause long-term adverse effects in the aquatic environment

International regulations:

Japan: Thimerosal (PRTR classification: I, Industrial Safety and Health Act: MSDS and labeling required); Hydrochloric Acid (Chemical Substances Control Law classification: Existing, Industrial Safety and Health Act: MSDS required, Air Pollution Control Law); Sulfuric Acid (Chemical Substances Control Law classification: Existing, Industrial Safety and Health Act: MSDS required, Air Pollution Control Law);

Note: Product not classified according to EU regulations. For information on Hazard Symbol and EC number of pure form of hazardous constituents, refer to section 2. Japanese regulations pertain to pure forms of components, and not for forms at the concentrations used in the product(s).

Section 16: Other Information

Disclaimer: For R & D use only. Not for drug, household or other uses.

Warranty: The above information is correct to the best of our knowledge. This information is not guaranteed to be all inclusive. The user should handle all materials with care using the MSDS as a guideline only. PBL Biomedical Laboratories shall not be held responsible for any damage resulting from handling or from contact with the above product.