

# SAFETY DATA SHEET



Conforms to regulation (EC) no. EU 453/2010

## SECTION 1 - IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

### 1.1 Product Identifier

**Product Name:** ProtoMarkers

**Product Number:** EC-898

### 1.2 Relevant Identified Uses of the Substance/Mixture and Uses Advised Against

Investigational research by professional users

### 1.3 Details of the Supplier of the Safety Data Sheet

#### Manufacturer

National Diagnostics  
305 Patton Drive  
Atlanta, GA 30036  
(404) 699-2121  
(800) 526-3867  
info@nationaldiagnostics.com

### 1.4 Emergency Telephone Number

#### ChemTel Inc.

Contract number MIS8894340

1-800 255-3924 (United States, Canada, Puerto Rico & US Virgin Islands)

01-800-099-0731 (Mexico)

400-120-0751 (China)

000-800-100-4086 (India)

1-300-954-583 (Australia)

0-800-591-6042 (Brazil)

+1-813-255-3924 (All other regions)

## SECTION 2 - HAZARDS IDENTIFICATION

### 2.1 Classification of the Substance or Mixture

#### Classification according to Regulation (EC) No. 1272/2008 [EU-GHS/CLP]

H302 - Acute Toxicity-Oral (Category 4)

H312 - Acute Toxicity-Dermal (Category 4)

H315 - Skin Corrosion/Irritation (Category 2)

H319 - Serious Eye Damage/Eye Irritation (Category 2A)

H332 - Acute Toxicity-Inhalation (Category 4)

### 2.2 Label Elements

#### GHS LABEL ELEMENTS AND CLASSIFICATION

##### GHS Label Elements



#### WARNING

H302 - Harmful if swallowed

H312 - Harmful in contact with skin.

H315 - Causes skin irritation.

H319 - Causes serious eye irritation.

H332 - Harmful if inhaled.

P262 - Do not get into eyes, on skin or on clothing.

P264 - Wash skin thoroughly after handling.

P280 - Wear protective gloves/protective clothing/eye protection/face protection.

P301+P312 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician IF you feel unwell.

P302+P352 - IF ON SKIN: Wash with plenty of soap and water.

P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes.

Remove contact lenses if present and easy to do. Continue rinsing.

P304+P341 - IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.

### 2.3 Other Hazards

None found.

## SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

### 3.2 Mixture

#### Chemical Names/Description

Aqueous solution of tris base, SDS, glycerol, mercaptoethanol (and dyed proteins <1%)

### Component List

Component	% Comp.	CAS #	EC #	1278/2008
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					<b>Classification</b>
2-Mercaptoethanol	2	60-24-2	200-464-6	H301, H310, H315, H317, H318, H331, H373, H400, H410	
Tris-Base	1.5	77-86-1	201-064-4	H315, H319, H335	

## SECTION 4 - FIRST AID MEASURES

### 4.1 Description of First Aid Measures

#### Inhalation

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

#### Ingestion

Do not induce vomiting. If swallowed and the person is conscious, immediately give large amounts of water. Get medical attention.

#### Skin

Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

#### Eyes

Immediately flush eyes with plenty of water for at least fifteen minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

### 4.2 Most Important Symptoms and Effects, Both Acute and Delayed

#### Inhalation

##### 2-Mercaptoethanol:

Symptoms may include coughing, sore throat, shortness of breath, headaches, nausea, and vomiting. Prolonged exposure can cause CNS stimulation.

##### Tris-Base:

Coughing, shortness of breath.

#### Ingestion

##### 2-Mercaptoethanol:

Symptoms may include sore throat, abdominal pain, and vomiting.

##### Tris-Base:

Symptoms may include nausea, vomiting, and diarrhea. Large oral doses may cause weakness, collapse, blood clotting, and coma. The estimated lethal dose of Tris Base is 50 grams dry solid.

#### Skin

##### 2-Mercaptoethanol:

Symptoms may include skin irritation.

##### Tris-Base:

Redness, itching, and pain.

#### Eyes

##### 2-Mercaptoethanol:

Symptoms may include redness and pain.

##### Tris-Base:

Redness, itching, and pain.

### 4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed

Unknown/not applicable

## SECTION 5 - FIRE FIGHTING MEASURES

### 5.1 Extinguishing media

Use media appropriate to the primary cause of fire.

### 5.2 Special Hazards Arising from the Substance/Mixture

#### Hazardous Combustion Products

Thermal decomposition products may include toxic oxides of nitrogen, sulfur, and carbon.

#### Hazardous Decomposition Products

Toxic gases may be involved in a fire. Glycerin decomposes upon heating above 290C, forming corrosive gas (acrolein).

#### Hazardous Polymerization

Will not occur under normal conditions of use (See Sections 10.4 & 10.5).

### 5.3 Advice for Firefighters

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the

pressure demand or other positive pressure mode.

#### 5.4 Further Information

No data available.

### SECTION 6 - ACCIDENTAL RELEASE MEASURES

#### 6.1 Personal Precautions

Wear appropriate protective equipment as specified in Section 8.

#### 6.2 Environmental Precautions

Prevent discharge into the environment. Dike spills and stop leakage where practical. Do not allow material to enter drains.

#### 6.3 Methods and Materials for Containment and Cleaning Up

Contain and clean up spill immediately, prevent from entering floor drains. Contain liquids using absorbents. Shovel all spill materials into disposal drum. Scrub spill area with detergent, flush with copious amounts of water.

#### 6.4 References to Other Sections

For disposal information, see Section 13. For protective clothing and equipment, see Section 8.

### SECTION 7 - HANDLING AND STORAGE

#### 7.1 Precautions for Safe Handling

Avoid contact and inhalation. Do not get in eyes, on skin, on clothing. Wash thoroughly after handling.

#### 7.2 Conditions for Safe Storage (including any incompatibles)

Keep frozen until ready to use. Protect from physical damage. Isolate from incompatible materials (section 10).

##### Incompatibles

###### 2-Mercaptoethanol:

Oxidizing agents, moisture, Avoid contact with metals.

###### Tris-Base:

No incompatibility data found.

#### 7.3 Specific End Uses

Investigational research by professional users

### SECTION 8 - EXPOSURE CONTROLS/PERSONAL PRECAUTIONS

#### 8.1 Control Parameters

##### Component: 2-Mercaptoethanol

ACGIH Threshold Limit Value (TLV): Not Established

OSHA Permissible Exposure Limit (PEL): AIHA WEEL 0.2ppm, 8 hr. TWA

##### Component: Tris-Base

ACGIH Threshold Limit Value (TLV): none established

OSHA Permissible Exposure Limit (PEL): none established

#### 8.2 Exposure Controls

##### Engineering Controls

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source.

##### Respiratory Protection

If the exposure limit is exceeded, wear a supplied air, full-facepiece respirator, airtight hood, or full-facepiece self-contained breathing apparatus.

##### Eye Protection

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

##### Skin Protection

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

### SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

#### 9.1 Information on Basic Physical & Chemical Properties

a. Appearance	Clear, colorless solution	b. Odor	None
c. Odor Threshold	N.A.	d. pH	6.8
e. Melting/Freezing Point (°C)	-5	f. Boiling point (°C)	107
g. Flash Point (°C)	N.A.	h. Evaporation Rate	Water

<b>i. Flammability</b>	N.A.	<b>j. Upper/Lower Flammability or Explosive Limits</b>	N.A.
<b>k. Vapor Pressure</b>	Water	<b>l. Vapor Density (Air = 1)</b>	Water
<b>m. Relative Density</b>	No information.	<b>n. Water Solubility</b>	Soluble
<b>o. Partition Coefficient n-octanol/water</b>	mixture	<b>p. Autoignition Temperature (°C)</b>	N.A.
<b>q. Decomposition Temperature (°C)</b>	N.A.	<b>r. Viscosity</b>	No data available.
<b>s. Explosive Properties</b>	N.A.	<b>t. Oxidizing Properties</b>	Not an oxidizer

## SECTION 10 - STABILITY AND REACTIVITY

### 10.1 Reactivity

Non reactive under normal conditions of use and storage.

### 10.2 Chemical Stability

Stable under recommended conditions of use and storage.

### 10.3 Possibility of Hazardous Reactions

Will not occur under normal conditions of use (See Sections 10.4 & 10.5).

### 10.4 Conditions to Avoid

Heat, incompatibles.

### 10.5 Incompatible Materials

#### 2-Mercaptoethanol:

Oxidizing agents, moisture, Avoid contact with metals.

#### Tris-Base:

No incompatibility data found.

### 10.6 Hazardous Decomposition Products

Toxic gases may be involved in a fire. Glycerin decomposes upon heating above 290C, forming corrosive gas (acrolein).

## SECTION 11 - TOXICOLOGICAL INFORMATION

### Product LD50 Values

#### Oral Rat LD50 (mg/kg)

12200

#### Dermal Rabbit LD50 (mg/kg)

7500

### Component Cancer List Status

	NTP Carcinogen		IARC Category
	Known	Anticipated	
2-Mercaptoethanol	No	No	None
Tris-Base	No	No	None

### Potential Health Effects

#### Inhalation

##### 2-Mercaptoethanol

Vapors irritate the mucous membranes and respiratory tract.

##### Tris-Base

Causes irritation to the respiratory tract.

#### Ingestion

##### 2-Mercaptoethanol

Toxic. Harmful if swallowed. Sore throat, abdominal pain and vomiting may occur.

##### Tris-Base

Causes irritation and reddening to the mucous membranes of the mouth, esophagus, and gastrointestinal tract.

#### Skin

##### 2-Mercaptoethanol

Toxic. Causes skin irritation and may be absorbed in the body in toxic quantities.

##### Tris-Base

Causes irritation to the skin.

#### Eyes

**2-Mercaptoethanol**

Vapors irritate the eyes with redness and pain. Splashes may cause severe irritation.

**Tris-Base**

Causes irritation to the eyes.

**Carcinogenicity****2-Mercaptoethanol**

Substance is neither a known nor an anticipated carcinogen. Not listed by NTP, IARC, or OSHA.

**Tris-Base**

Not listed as a carcinogen by NTP or IARC.

**Mutagenicity****2-Mercaptoethanol**

No information available.

**Tris-Base**

No information found.

**Reproductive Toxicity****2-Mercaptoethanol**

No information available.

**Tris-Base**

No information found.

**Teratogenic Effects****2-Mercaptoethanol**

No information available.

**Tris-Base**

No information found.

**Routes of Entry****2-Mercaptoethanol**

Toxic effects possible by inhalation, ingestion, and skin absorption.

**Tris-Base**

Ingestion.

**Target Organ Statement****2-Mercaptoethanol**

Behavioral: Tremor, convulsion, excitement, muscle contraction/spasticity. Lungs, thorax: Respiratory depression. GI: Changes in structure/function of salivary glands.

**Tris-Base**

No information available.

**SECTION 12 - ECOLOGICAL INFORMATION****12.1 Toxicity****COMPONENT: 2-Mercaptoethanol**

	<b>Vertebrates</b>	<b>Invertebrates</b>	<b>Algae</b>	<b>Microorganisms</b>
Aquatic Toxicity (ppm unless otherwise noted)	LC50 (96hr, golden orfe) 37 mg/L	EC50 (daphnia, 48 hr) 0.4 mg/L	LC50 (96h) : 19 mg/L	EC50 (17 h) : 113 mg/l

	<b>Birds</b>	<b>Arthropods</b>	<b>Plants</b>	<b>Microorganisms</b>
Terrestrial Environment Toxicity (ppm unless otherwise noted)	No data	No data	No data	No data

**COMPONENT: Tris-Base**

	<b>Vertebrates</b>	<b>Invertebrates</b>	<b>Algae</b>	<b>Microorganisms</b>
Aquatic Toxicity (ppm unless otherwise noted)	LC50 460mg/l (Golden ide)	EC50: 59.8 mg/L (Daphnia)	EC50: 473mg/l @ 48 hrs	CE50>1000mg/L (3hrs)

	<b>Birds</b>	<b>Arthropods</b>	<b>Plants</b>	<b>Microorganisms</b>
Terrestrial Environment Toxicity (ppm unless otherwise noted)	No data	No data	No data	No data

**12.2 Persistence and Degradability****2-Mercaptoethanol**

Biodegradable (90% in 28 days)

**Tris-Base**  
Readily Biodegradable (>97% degradation at 28 days)

### 12.3 Bioaccumulative Potential

**2-Mercaptoethanol**  
No data

**Tris-Base**  
No data

### 12.4 Mobility in Soil

**2-Mercaptoethanol**  
Koc 1.325

**Tris-Base**  
Log Koc 1.57-1.85

### 12.5 Results of PBT and vPvB Assessment

**2-Mercaptoethanol**  
Not a PBT or vPvB

**Tris-Base**  
Not a PBT or vPvB

### 12.6 Other Adverse Effects

**2-Mercaptoethanol**  
None

**Tris-Base**  
None

## SECTION 13 - DISPOSAL CONSIDERATIONS

### 13.1 Waste Treatment Methods

Offer surplus or non-recyclable product to licensed disposal company. Disposal is subject to user compliance with applicable law and product characteristics at time of disposal. Dispose of packaging as product.

## SECTION 14 - TRANSPORT INFORMATION

	ADR/RID	IATA	IMO	DOT
14.1 UN Number	N.A.	N.A.	N.A.	N.A.
14.2 Shipping Name	Not regulated.	Not regulated.	Not regulated.	Not regulated.
14.3 Hazard Class	N.A.	N.A.	N.A.	N.A.
14.4 Packing Group	N.A.	N.A.	N.A.	N.A.
14.5 Environmental Hazards	N.A.	N.A.	N.A.	N.A.
14.6 Special Precautions	N.A.	N.A.	N.A.	N.A.

## SECTION 15 - REGULATORY INFORMATION

### 15.1 Safety, Health and Environmental Regulations/Legislation Specific for the Substance/Mixture

#### United States

##### TSCA Regulatory Statement

All intentional ingredients are listed on the TSCA Inventory.

##### SARA 311/312 Hazard Categories

Component	Fire	Pressure	Reactivity	Acute	Chronic
2-Mercaptoethanol	Yes	No	No	Yes	No
Tris-Base	No	No	No	Yes	No

#### Europe

##### EEC Regulatory

All intentional ingredients are listed on the European EINECS Inventory.

## SECTION 16 - OTHER INFORMATION

### Revisional Updates

4/26/2019 - Updated Section 1.4  
5/29/2015 - Updated Sections 2.1 and 3.2  
10/11/2013 - Released Version 1.0

### NFPA Codes

Health N.D. Flammability N.D. Reactivity N.D.

### Dangers

**2-Mercaptoethanol**  
H301 - Toxic if swallowed

H310 - Fatal in contact with skin.  
H315 - Causes skin irritation.  
H317 - May cause an allergic skin reaction.  
H318 - Causes serious eye damage.  
H331 - Toxic if inhaled.  
H373 - May cause damage to organs through prolonged or repeated exposure.  
H401 - Toxic to aquatic life.  
H410 - Very toxic to aquatic life with long lasting effects.

**Tris-Base**

H315 - Causes skin irritation.  
H319 - Causes serious eye irritation.  
H335 - May cause respiratory irritation.

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