

# Safety Data Sheet

Revision Date: 9/5/2017

## Section 1: Chemical Identification

### 1.1 Chemical Identification

**Product Name:** Putrescine, free base  
**Alternative Name:** 1,4-Diaminobutane Tetramethylenediamine  
**Catalog Number:** P-245

### 1.2 Relevant Uses and Uses Advised Against

**Recommended use:** This product is not for use in humans. It is for research purposes only.

### 1.3 Supplier Contact Information

**Distributed by:** Gold Biotechnology, Inc.  
 1328 Ashby Rd.  
 St. Louis, MO 63132  
**Phone:** (314) 890-8778  
**Fax:** (314) 890-0503  
**Email:** [contactgoldbio86@goldbio.com](mailto:contactgoldbio86@goldbio.com)

### 1.4 Emergency Contact Information

**Emergency Phone:** (800)248-7609 (Monday-Friday, 9:00 a.m. – 5:00 p.m. CST)

## Section 2: Hazardous Information

### 2.1 GHS Classification

Flammable Liquid (Category 3)  
 Acute Toxicity, Oral (Category 4)  
 Acute Toxicity, Vapors (Category 2)  
 Acute Toxicity, Dermal (Category 3)  
 Skin Corrosion (Category 1B)  
 Serious Eye Damage (Category 1)

### 2.2 GHS Label Elements, Including Precautionary statements



DANGER!

### 2.3 Hazard Statements

**H226:** Flammable liquid and vapour  
**H302:** Harmful if swallowed  
**H311:** Toxic in contact with skin

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H314: Causes severe skin burns and eye damage

H330: Fatal if inhaled

## **2.4 Precautionary Statements**

P210: Keep away from heat/sparks/open flames/hot surfaces – No smoking

P233: Keep container tightly closed

P240: Ground/bond container and receiving equipment

P241: Use explosion-proof electrical/ventilating/light/.../equipment

P242: Use only non-sparking tools

P243: Take precautionary measures against static discharge

P260: Do not breathe dust/fume/gas/mist/vapours/spray

P264: Wash skin thoroughly after handling

P270: Do not eat, drink or smoke when using this product

P271: Use only outdoors or in a well-ventilated area

P280: Wear protective gloves/protective clothing/eye protection/face protection

P284: Wear respiratory protection

P301+312: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell

P301+330+331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting

P303+361+353: IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower

P304+340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing

P305+351+338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing

P362: Take off contaminated clothing and wash before reuse

P370+378: In case of fire: Use dry sand, dry chemical, or alcohol resistant foam for extinction

P403+233: Store in a well ventilated place. Keep container tightly closed

P403+235: Store in a well ventilated place. Keep cool

P405: Store locked up

P501: Dispose of contents/container to an approved waste disposal plant

## **2.8 HMIS Classification**

Health Hazard: 3

Chronic Health Hazard: \*

Flammability: 2

Physical Hazards: 3

## **2.9 NFPA Rating**

Health Hazard: 4

Fire: 2

Reactivity Hazard: 3

# **Section 3: Composition/Information on Ingredients**

## **3.1 Composition**

**Identity:** Putrescine, free base

**IUPAC:** butane-1,4-diamine

**Synonyms:** 1,4-Diaminobutane Tetramethylenediamine

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**CAS Number:** 110-60-1  
**Molecular Formula:** C<sub>4</sub>H<sub>12</sub>N<sub>2</sub>  
**Molecular Weight:** 88.15 g/mol

## **Section 4: First Aid Measures**

### **4.1 Detailed First Aid Measures**

**Inhalation:** If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

**Skin:** Immediately wash skin copiously with soap and water. Take victim immediately to hospital. Consult a physician.

**Eye:** Immediately rinse out with water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Consult a physician.

**Ingestion:** Wash out mouth with water. Drink plenty of water. Consult a physician. Never give anything by mouth to an unconscious person.

**Notes to Physician:** Treat symptomatically and supportively.

### **4.2 Most Important Symptoms And Effects, Either Acute Or Delayed**

The most important known symptoms and effects are described in the labeling (see section 2). And /or in section 11.

### **4.3 Indication of immediate medical attention and special treatment needed**

Not available

## **Section 5: Fire Fighting Measures**

### **5.1 Conditions of flammability:**

Not flammable or combustible.

### **5.2 Suitable extinguishing media:**

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

### **5.3 Specific hazards arising from the chemical**

During a fire, highly toxic gases may be generated by thermal decomposition or combustion – Carbon Oxides, Nitrogen oxides (NO<sub>x</sub>).

### **5.4 Specific protective actions for fire-fighters:**

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

## **Section 6: Accidental Release Measures**

### **6.1 Personal precautions, protective equipment and emergency procedures:**

Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation.

### **6.2 Environmental precautions:**

Do not let product enter drains.

### **6.3 Methods and materials for containment and cleaning up:**

Soak up with absorbent material, discard.

## **Section 7: Handling and Storage**

### **7.1 Precautions for safe handling:**

Always wear personal protective equipment (PPE, see section 8).

### **7.2 Conditions for safe storage, including and incompatibilities:**

Keep container tightly closed.

Stench. Air and moisture sensitive. Sensitive to carbon dioxide. Hygroscopic. Over time, pressure may increase causing containers to burst. Store under inert gas.

Store desiccated at -20°C.

## **Section 8: Exposure Controls / Personal Protection**

### **8.1 Control Parameters:**

Contains no substances with occupational exposure limit values.

### **8.2: Appropriate engineering controls:**

Contains no substances with occupational exposure limit values.

### **8.3 Personal Protective Equipment (PPE):**

**Eye/Face Protection:** Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

**Skin Protection:** Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique - without touching outer surface of glove - to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

**Respiratory Protection:** Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**Other Protective Clothing or Equipment:** Wear appropriate protective clothing to prevent exposure.

## **Section 9: Physical and Chemical Properties**

### **9.1 General chemical and physical properties**

<b>Appearance:</b>	Solid, colorless
<b>Odor:</b>	Not Available
<b>Odor Threshold:</b>	Not Available
<b>pH:</b>	Not Available
<b>Melting Point:</b>	27-28°C
<b>Freezing Point:</b>	Not Available
<b>Boiling Point/Range:</b>	60-61°C at 15 hPa
<b>Flash Point:</b>	Not Available
<b>Evaporation Rate:</b>	Not Available
<b>Lower Explosion Limit:</b>	Not Available
<b>Upper Explosion Limit:</b>	Upper explosion limit: 9.08 %(V)
<b>Vapor Pressure:</b>	Not Available
<b>Vapor Density:</b>	Not Available
<b>Relative Density:</b>	Not Available
<b>Solubility:</b>	Not Available
<b>Partition Coefficient n-octanol/water:</b>	Not Available
<b>Auto-Ignition Temperature:</b>	Not Available
<b>Decomposition Temperature:</b>	Not Available
<b>Viscosity:</b>	Not Available

## **Section 10: Stability and Reactivity Data**

### **10.1 Reactivity:**

Not available

### **10.2 Chemical Stability:**

Stable under recommended storage conditions.

### **10.3 Possibility of hazardous reactions:**

Not available.

### **10.4 Conditions to avoid:**

Incompatible materials.

### **10.5 Incompatible materials:**

Strong oxidizing agents.

### **10.6 Hazardous decomposition products:**

Hazardous decomposition products formed under fire conditions. - Carbon Oxides, Nitrogen oxides (NOx).

## **Section 11: Toxicological Information**

### **11.1 Toxicological effects**

#### **Acute toxicity:**

Putrescine, free base	Oral:	LD <sub>50</sub> Rat: 463 mg/kg Remarks: Behavioral:Somnolence (general depressed activity). Sense Organs and Special
Putrescine, free base	Inhalation:	LC <sub>50</sub> Rat: 4 h - 877 - 1,297 mg/m3
Putrescine, free base	Skin:	LD <sub>50</sub> Rabbit: 1,576 mg/kg Remarks: Behavioral:Somnolence (general depressed activity). Kidney, Ureter, Bladder:Other
Putrescine, free base	Skin:	LD <sub>50</sub> Rabbit: 614 - 1,228 mg/kg (OECD Test Guideline 402)

#### **Skin corrosion/irritation:**

Not available.

#### **Respiratory or skin sensitization:**

Not available.

#### **Germ cell mutagenicity:**

Mouse  
Liver  
DNA inhibition

Mouse  
Liver  
Unscheduled DNA synthesis

#### **Carcinogenicity:**

- IARC:** No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
- ACGIH:** No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by ACGIH.
- NTP:** No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by NTP.
- OSHA:** No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

#### **Reproductive toxicity:**

Developmental Toxicity - Mouse - Intraperitoneal. Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus). Effects on Embryo or Fetus: Other

effects to embryo. Specific Developmental Abnormalities: Musculoskeletal system.

**STOT-single exposure:**

Not available.

**STOT-repeated exposure:**

Not available.

**Aspiration hazard:**

Not available.

**Likely routes of exposure:**

Respiratory organs, mouth, skin, and eyes.

**Symptoms of exposure:**

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., Cough, Shortness of breath, Headache, Nausea

## **Section 12: Ecological Information**

**12.1 Toxicity:**

Not available.

**12.2 Persistence and degradability:**

Inherent biodegradability.

**12.3 Bioaccumulative potential:**

Does not bioaccumulate.

**12.4 Mobility in soil:**

Not available.

**12.5 Other adverse effects:**

None.

## **Section 13 Disposal Considerations**

Dispose of product in accordance with local rules and regulations.

## **Section 14: Transport Information**

**14.1 US Department of Transportation (DOT)**

**UN Number:** 2925  
**Proper shipping name:** Flammable solids, corrosive, organic, n.o.s.  
(Tetramethylenediamine)  
**Class:** 4.1 (8)  
**Packing Group:** II  
**Marine Pollutant:**

**14.2 International Maritime Dangerous Goods (IMDG):**

**UN Number:** 2925

**Proper shipping name:** Flammable solids, corrosive, organic, n.o.s.  
(Tetramethylenediamine)  
**Class:** 4.1 (8)  
**Packing Group:** II  
**Marine Pollutant:**

#### **14.2 International Air Transportation Association (IATA)**

**UN Number:** 2925  
**Proper shipping name:** Flammable solids, corrosive, organic, n.o.s.  
(Tetramethylenediamine)  
**Class:** 4.1 (8)  
**Packing Group:** II  
**Marine Pollutant:**

### **Section 15: Regulatory Information**

#### **SARA 302 Components:**

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

#### **SARA 313 Components:**

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.

#### **SARA 311/312 Hazards:**

No SARA Hazards.

#### **Massachusetts Right To Know Components:**

Putrescine, free base CAS - No. 110-60-1

#### **Pennsylvania Right To Know Components:**

Putrescine, free base CAS - No. 110-60-1

#### **New Jersey Right To Know Components:**

Putrescine, free base CAS - No. 110-60-1

#### **California Prop. 65 Components:**

This product does not contain any chemical known to the State of California to cause cancer, birth, or any other reproductive defects.

### **Section 16: Other Information**

While Gold Biotechnology, Inc. believes the information contained herein to be true and accurate, it has relied on information provided by others. Gold Biotechnology, INC. makes no warranties, express or implied, as to the accuracy or adequacy of the information contained herein or with respect to the results to be obtained from the use of the product. Gold Biotechnology, Inc. disclaims all liability with respect to the use of this product, including without limitation, liability for injury to the user or third-party persons.

#### **Preparation Information**

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