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# MATERIAL SAFETY DATA SHEET

## I PRODUCT IDENTIFICATION

**Trade Name**: Barium Nitride
**Synonyms**: Barium nitride, Tribarium Dinitride
**Formula**: $Ba_3N_2$
**Chemical Family**: Metal Nitride
**Molecular Weight**: 440.00
**CAS #**: 12047-79-9

## II HAZARDOUS INGREDIENTS

| Hazardous Components | % | OSHA PEL | ACGIH TLV | Other Limits |
|---|---|---|---|---|
| Barium Nitride | 0-100 | 0.5 mg (Ba)/$m^3$ | 0.5 mg (Ba)/$m^3$ | NE |

**Sec. 302 (EHS)**: No **Sec. 304**: No **Sec. 313**: Yes
**HMIS Ratings(0-4)**: **Health**: 3 **Flammability**: 2 **Reactivity**: 2

## III PHYSICAL DATA

**Boiling Point**: NA
**Melting Point**: NA
**Specific Gravity ($H_2O$=1)**: 4.783 at 25.0 °C
**Solubility in $H_2O$**: Decomposes to ammonia
**Vapor Pressure (mm Hg)**: NA
**Vapor Density (Air=1)**: NA
**Evaporation Rate**: NA (Butyl Acetate=1)
**Percent Volatile**: NA
**Appearance and Odor**: Yellowish-brown powder, ammonia odor in moist air.

## IV FIRE AND EXPLOSION HAZARDS DATA

**Flash Point (Method used)**: NA, non-flammable
**Explosive Limits**: **LEL**: NA **UEL**: NA

**Extinguishing Media**: USE: Class D or other metal extinguishing agent. **DO NOT USE**: Water.
**Special Fire Fighting Procedures**: Wear a full face self-contained breathing apparatus and full protective clothing to prevent contact with skin and eyes. Fumes from fire are hazardous. Isolate runoff to prevent environmental pollution.

**Unusual Fire and Explosion Hazards**: Barium nitride reacts violently with air or water. Dangerous: explodes upon heating and by spontaneous chemical reaction with water liberating ammonia vapors which can form explosive mixtures with air.

## V HEALTH HAZARD INFORMATION

**Health Hazards (Acute and Chronic)**:

To the best of our knowledge the chemical, physical and toxicological properties of barium nitride have not been thoroughly investigated and recorded. The soluble barium salts are poisonous when ingested. Ammonia gas is a human poison by an unspecified route. Poison by inhalation, ingestion, and possibly other routes. An eye, mucous membrane, and systematic irritant by inhalation. Mutation data reported (Sax, Dangerous Properties of Industrial Materials, eighth edition).

**Routes of Entry**: Inhalation, Skin, Eyes, Ingestion.

**Acute Effects**:

**Inhalation**: May cause irritation to the upper respiratory tract, a slow pulse, extrasystoles, hypokalemia and acute barium poisoning. Ammonia gas may cause irritation to the nose and throat, dyspnea, bronchial spasms, chest pain, pulmonary edema and pink frothy sputum.
**Ingestion**: May cause gastrointestinal disturbances, muscular spasms and acute barium poisoning. Ammonia gas may cause nausea, vomiting and burns.
**Skin**: May be an irritant and possibly corrosive. Ammonia gas may cause irritation and chemical burns.
**Eyes**: May be an irritant and possibly corrosive. Ammonia gas may cause severe irritation and chemical burns.

**Chronic Effects**:

**Inhalation**: May cause chronic barium poisoning. Repeated or prolonged exposure to ammonia may cause swelling of mouth and throat to the point of asphyxiation, permanent injury and death.
**Ingestion**: May cause chronic barium poisoning.
**Skin**: Repeated or prolonged exposure to ammonia gas may cause tissue damage.
**Eye**: Repeated or prolonged exposure to ammonia gas may cause irreversible damage to the conjunctiva, cornea and lens.

**Target Organs**: May affect the respiratory system, heart, central nervous system, skin and eyes.
**Medical Conditions Generally Aggravated by Exposure**: Pre-existing respiratory and skin disorders.
**Carcinogenicity**: **NTP**: No **IARC Monographs**: No **OSHA Regulated**: No

**Signs and Symptoms of Exposure**:
**Inhalation**: May cause coughing, sneezing and difficulty breathing. Acute barium poisoning may cause: A slow, hard pulse and elevated blood pressure, excessive salivation, vomiting, colic, violent diarrhea, convulsive tremors, muscular paralysis and raises blood pressure. High blood pressure can cause the stomach, intestines and kidneys to hemorrhage. Chronic barium poisoning is similar but less severe than acute barium poisoning.
**Ingestion**: See inhalation for acute and chronic barium poisoning symptoms. May cause a burning sensation, throat swelling, salivation, nausea, vomiting, cramps, rapid breathing and diarrhea.
**Skin**: May cause redness, itching, inflammation, blistering, and tissue damage.
**Eye**: May cause redness, itching, burning, watering, and lens opacities and ulceration of the conjunctiva and cornea.

**EMERGENCY AND FIRST AID PROCEDURES**:

**INHALATION**: Remove to fresh air. Keep warm and quiet, give oxygen if breathing is difficult and seek medical attention.
I**NGESTION**: If conscious, give 1-2 glasses of milk or water and induce vomiting, seek medical attention. Never give anything by mouth or induce vomiting on an unconscious person.
**SKIN**: Remove contaminated clothing from affected area, brush material off skin, wash affected area with mild soap and water, seek medical attention.
**EYES**: Flush eyes with lukewarm water, lifting upper and lower eyelids, for at least 15 minutes. Seek medical attention.

## VI REACTIVITY DATA

**Stability**: Stable

**Conditions to Avoid**: None
**Incompatibilities**: Water, steam, moisture and air.

**Hazardous Decomposition Products**: Ammonia gas, barium and oxides of barium.
**Hazardous Polymerization**: Will not occur

## VII SPILL OR LEAK PROCEDURES

**Steps to Be Taken in Case Material Is Released or Spilled**: Wear appropriate respiratory and protective equipment specified in section VIII-Special Protection Information. Isolate spill area and provide ventilation. Vacuum up spill using a high efficiency particulate absolute (HEPA) air filter and place in a closed container for proper disposal. Take care not to raise dust.

**Waste Disposal Method**: Observe all Federal, State & Local regulations.

## VIII SPECIAL PROTECTION INFORMATION

**Respiratory Protection (Specify Type)**: Wear a NIOSH-approved dust-mist-fume cartridge respirator.
**Ventilation**: **Local**: To maintain concentration at or below the PEL, TLV **Mechanical**: Not recommended
**Special**: Handle in a controlled atmosphere. **Other**: Handle in an inert gas such as argon

**Protective Gloves**: Butyl or polycarbonate gloves.
**Eye Protection**: Safety Goggles
**Other Protective Equipment**: Suitable to prevent contamination.

**Work/Hygienic/Maintenance Practices**: Implement engineering and work practice controls to reduce and maintain concentration of exposure at low levels. Use good housekeeping and sanitation practices. Do not use tobacco or food in work area. Wash thoroughly before eating and smoking. Do not blow dust off clothing with compressed air.

## IX SPECIAL PRECAUTIONS

**Other Handling and Storage Conditions**:

- Store in a cool, dry area.
- Store in tightly sealed container.
- Wash thoroughly after handling.
- Store in an inert atmosphere.

Some of the chemicals listed herein are research or experimental substances which may be toxic, as defined by various governmental regulations. In accordance with Environmental Protection Agency regulation and the Toxic Substances Control Act (TSCA), these materials should only be handled by, or under the direct supervision of, a "technically qualified individual", as defined in 40 CFR 710.2(aa).

The above information is accurate to the best of our knowledge. However, since, data, safety standards, and government regulation are subject to change, and the conditions of handling and use or misuse are beyond our control, ESPI Makes No Warranty, Neither Expressed Nor Implied, with Respect to the Completeness or Continuing Accuracy of the Information Contained Herein, And Disclaims All Liability for Reliance Thereon. Users should satisfy themselves that they have all current data relevant to their particular use.

Prepared by: S. Dierks
Dated: June 1993