

Material Safety Data Sheet

1. IDENTIFICATION OF THE CHEMICAL PRODUCT AND OF THE COMPANY

1.1 Identification of the chemical product

Common/Trade Name : Bloicin for Injection (Bleomycin Sulfate for Injection)

Generic : Bleomycin Sulfate for Injection

Chemical Name : Bleomycin (sulfate); Blenoxane; Bleomycin sulfate; Bleomycin sulphate

Intended Use : Finished pharmaceutical product (Antineoplastic)

1.2 Company identification

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2. COMPOSITION/INFORMATION OF INGREDIENTS

Component	Molecular Formula	Molecular weight	CAS Number
Bleomycin Sulfate	C ₅₅ H ₈₄ N ₁₇ O ₂₁ S ₃	1512.619	9041-93-4
Water for Injection	H ₂ O	18.02	7732-18-5

3. HAZARD IDENTIFICATION

Emergency Overview : Bloicin for Injection, is a lyophilized powder that contains bleomycin sulfate, a mixture of cytotoxic glycopeptide antibiotics produced by *Streptomyces verticillus*.

Clinically, bleomycin sulfate is an antineoplastic antibiotic to treat certain types of cancers. It is a cytotoxic agent, and should be considered a potential occupational reproductive hazard, harmful to the fetus, and a potential human carcinogen. Following an accidental overexposure, possible target organs may include the lungs, liver, kidney, skin, cardiovascular system, and the fetus.

Occupational Exposure Potential : There are scientific studies that suggest that personnel (e.g. nurses, pharmacists, etc.) who prepare and administer parenteral antineoplastics (e.g. in hospitals) may be at some risk due to potential mutagenicity, teratogenicity, and/or carcinogenicity of these agents if workplace exposures are not properly controlled. The actual risk in the workplace is not known.

Signs and Symptoms : In the workplace, this product should be considered irritating to the skin, eyes, and respiratory tract. In clinical use, the most serious adverse effect is a delayed pulmonary toxicity. Interstitial pneumonitis occurs in about 10% of patients, and progresses to fibrosis and death in about 1% of patients. Other adverse effects may include rash, erythema, pruritus, vesiculation, hyperkeratosis, nail changes, alopecia, and hyperpigmentation. Fever is also a common occurrence. Acute anaphylactoid-like reactions with hyperpyrexia and cardiorespiratory distress/collapse have occurred in about 1% of patients.

Medical Conditions Aggravated by Exposure : Pre-existing hypersensitivity to bleomycin-like antibiotics. Pre-existing pulmonary, kidney, liver, skin, or cardiovascular ailments, or pregnancy.

4. FIRST-AID MEASURES

Eye Contact Remove from source of exposure. Flush with copious amounts of water. If irritation persists or signs of toxicity occur, seek medical attention. Provide symptomatic/supportive care as necessary.

Skin Contact Remove from source of exposure. Flush with copious amounts of water. If irritation persists or signs of toxicity occur, seek medical attention. Provide symptomatic/supportive care as necessary.

Inhalation Remove from source of exposure. If signs of toxicity occur, seek medical attention. Provide symptomatic/supportive care as necessary.

Ingestion Remove from source of exposure. If signs of toxicity occur, seek medical attention. Provide symptomatic/supportive care as necessary.

5. FIRE FIGHTING MEASURES

Flammability : Not applicable.

Fire & Explosion Hazard : None anticipated for this material.

Extinguishing Media : As with any fire, use extinguishing media appropriate for primary cause of fire.

Special Fire Fighting Procedures : Firefighters should wear self-contained breathing apparatus. Protective equipment and clothing should be worn to minimize contact with the respiratory tract, skin and eyes.

6. ACCIDENTAL RELEASE MEASURES

Spill Cleanup and Disposal : For spilled powder, isolate area around spill. Put on suitable protective clothing and equipment as specified by site spill procedures. Collect the spilled powder using techniques that minimize powder migration. Clean affected area with soap and water. Dispose of materials according to the applicable federal, state, or local regulations.

If a spill occurs after reconstitution, absorb liquid with suitable material and clean affected area with soap and water. Dispose of materials according to the applicable federal, state, or local regulations.

7. HANDLING AND STORAGE

Handling : Bleomycin sulfate is a cytotoxic agent. Appropriate procedures should be implemented during the handling and disposal of cytotoxic antineoplastic agents to minimize potential exposures. Several guidelines on handling cytotoxic antineoplastic agents have been published. Consult your hygienist or safety professional for your site requirements.

Avoid ingestion, inhalation, skin contact, and eye contact. When handling the powder, precautions may include the use of a containment cabinet during the weighing, reconstitution and/or solubilization of this antineoplastic agent. The use of disposable gloves and respiratory protection is recommended. Proper disposal of contaminated vials, syringes, or other materials is required when working with this material.

Storage : No special storage is required for hazard control. However, employees should be trained on the proper storage procedures for antineoplastic agents. For product protection, follow USP controlled room temperature storage recommendations noted on the product case label, the primary container label, or the product insert.

Special Precautions : Persons with known allergies to bleomycin-like compounds, women who are pregnant, or women who want to become pregnant, should consult a health and/or safety professional prior to handling this material.



8. EXPOSURE CONTROL / PERSONAL PROTECTION

Respiratory Protection : Respiratory protection is normally not needed during intended product use. However, if the generation of dusts or aerosols is likely, and engineering controls are not considered adequate to control potential airborne exposures, the use of an approved air-purifying respirator with a HEPA cartridge is recommended under conditions where airborne dust or aerosol concentrations are not expected to be excessive. For uncontrolled release events, or if exposure levels are not known, provide respirators that offer a high protection factor such as a powered air purifying respirator or supplied air. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions require respirator use. Personnel who wear respirators should be fit tested and approved for respirator use as required.

Skin Protection : When handling this material, disposable gloves should be worn at all times. Further, the use of double gloves is recommended. Disposable gloves made from nitrile, neoprene, polyurethane or natural latex generally have low permeability to this material. Persons known to be allergic to latex rubber should select a non-latex glove. Gloves should be changed regularly, and removed immediately after known contamination. Care should be taken to minimize inadvertent contamination when removing and/or disposing of gloves.

Eye Protection : As a minimum, the use of chemical safety goggles is recommended when handling this material.

Engineering Controls : When handling the dry powder, local exhaust ventilation is recommended to minimize employee exposure. The use of an enclosure, such as an approved ventilated cabinet designed to minimize airborne exposures, is recommended.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance/Physical State : White freeze-dried cake in a colorless vial.

Odor : NA

Odor Threshold : NA

pH : 4.5 to 6.0.

Melting Point/Freezing Point : (For Bleomycin Sulfate) 158 - 160 °F (70 - 71.1 °C)

Initial Boiling Point/Boiling Point Range : NA

Evaporation Rate : NA

Flammability (Solid, Gas) : NA

Upper/Lower Flammability or Explosive Limits : NA

Vapor Pressure : NA

Vapor Density : NA

Evaporation Rate : NA

Specific Gravity : NA

Solubility : (For Bleomycin Sulfate) Very soluble in methanol and water; slightly soluble in ethanol; practically insoluble in acetone, in ethyl acetate, in butyl acetate, and in ether.

Partition Coefficient: n-octanol/Water : NA

Auto-ignition Temperature : NA

Decomposition Temperature : NA

10. STABILITY AND REACTIVITY

Reactivity : Not determined

Chemical Stability : Stable under standard use and storage conditions.

Hazardous Reactions : Not determined

Conditions to Avoid : Not determined

Incompatibilities : Bleomycin solution should not be mixed with solutions of essential amino acids, riboflavine, ascorbic acid, dexamethasone, aminophylline or frusemide.



Hazardous Decomposition Products : Not determined. During thermal decomposition, it may be possible to generate irritating vapors and/or toxic fumes of carbon oxides (COx), nitrogen oxides (NOx), and sulfur oxides (SOx).

Hazardous Polymerization : Not anticipated to occur with this product.

11. TOXICOLOGICAL PROPERTIES

Aspiration Hazard : None anticipated from normal handling of this material.

Dermal Irritation/Corrosion : None anticipated from normal handling of this material. This material is anticipated to be irritating to the skin.

Ocular Irritation/Corrosion : None anticipated from normal handling of this material. This material is anticipated to be irritating to the eyes.

Dermal or Respiratory Sensitization : None anticipated from normal handling of this material.. In clinical use, acute anaphylactoid-like reactions with hyperpyrexia and cardiorespiratory distress/collapse have occurred in about 1% of patients at clinical doses.

Reproductive Effects : May damage fertility or the unborn child.

1.2 mg/kg/day Gestational study (day 6-18, intravenous)

Result: Fetotoxicity and miscarriage

Species: Rabbit

1.5 mg/kg/day Gestational study (day 6-15, intraperitoneal)

Result: Skeletal malformation, shortened innominate artery, hydroureter, and maternal toxicity

Species: Rat

8 mg/kg Developmental study (intraperitoneal)

Result: Fetotoxicity and birth defects

Species: Rat

Mutagenicity : May cause genetic defects

Ames test (S. typhimurium)

Result: Positive

Fertility Effects in Humans

Result: Increased frequency of chromosomal abnormalities in sperm during and within 18 months of therapeutic use

In vitro micronucleus (Chinese hamster ovary cells)

Result: Positive, with and without activation

In vitro micronucleus assay (human lymphocytes)

Result: Positive

Carcinogenicity : Suspected of causing cancer

0.35 mg/kg Two year (650 days) study of weekly subcutaneous injections

Result: Injection site fibrosarcomas as well as renal tumors

Species: Rat

Target Organ Effects : This material should be considered irritating to the skin, eyes, and respiratory tract. Following an accidental over-exposure, possible target organs may include the lungs, liver, kidney, skin, cardiovascular system, and the fetus.

12. ECOLOGICAL CONSIDERATIONS

Aquatic Toxicity : Not available

Persistence/ Biodegradability : Not determined

Bioaccumulation : Not determined

Mobility in Soil : Not determined



13. DISPOSAL CONSIDERATIONS

Waste Disposal : Disposal should be performed in accordance with the federal, state or local regulatory requirements.

Container Handling and Disposal : Dispose of containers and unused contents in accordance with federal, state and local regulations.

14. TRANSPORT INFORMATION

DOT STATUS : No Regulated

IMDG STATUS : No Regulated

ICAO/IATA STATUS : No Regulated

Proper Shipping Name : NA

Hazard Class : NA

UN Number : NA

Packing Group : NA

Reportable Quantity : NA

15. REGULATORY INFORMATION

(For Bleomycin Sulfate)

US Federal Regulations : CERCLA/SARA Hazardous Substances - Not applicable
One or more components are not listed on TSCA.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard Categories : Immediate Hazard - No

Delayed Hazard - Yes

Fire Hazard - No

Pressure Hazard - No

Reactivity Hazard - No

SARA 302 Extremely Hazardous substance : No

SARA 311/312 Hazardous Chemical : No

Other Federal Regulations

Safe Drinking Water Act (SDWA) : Not regulated

Food and Drug Administration (FDA) : Not regulated

US State Regulations : California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

16. OTHER INFORMATION

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