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## Material Safety Data Sheet

### Barium Chloride Dihydrate

Section 1: Chemical Product and Company Identification					
Product Name:	Barium Chloride Dihydrate				
Trade Names:	Barium Chloride Dihydrate				
Chemical Name:	Barium Chloride Dihydrate				
Chemical Formula:	BaCl <sub>2</sub> .2H <sub>2</sub> O				
CAS#:	10326-27-9				
EINECS No:	233-788-1				
Molecular Weight:	244.28				
Synonym:	Barium Chloride Dihydrate				
Catalog Codes:	TSHXC001				
TSCA 8(b) inventory:	Barium Chloride Dihydrate				
Product Grade:	Tech-Grade				
Section 2 - Composition, Information on Ingredients					
Composition:	CAS#	Chemical Name	Chemical Formula	% By Weight	EINECS/ELINCS
	10326-27-9	Barium Chloride Dihydrate	BaCl <sub>2</sub> .2H <sub>2</sub> O	>=99%	233-788-1
Section 3: Hazards Identification					
Emergency Overview: Danger! May be fatal if swallowed. Harmful if inhaled. May cause irritation to skin, eyes and respiratory tract. Affects heart, respiratory system, and central nervous system.					
Hazard Symbols: T		Environmental Hazard Symbols:			
					
Risk Phrases: R 20-25:Harmful by inhalation. R25: Toxic if swallowed. R53: May cause long-term adverse effects in the aquatic environment.					
Safety Description: S45: In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).					
NFPA (NATIONAL FIRE PROTECTION ASSOCIATION) Health = 3 Flammability = 0 Instability = 0 Special = None					
HMIS (HAZARDOUS MATERIAL INFORMATION SYSTEM) Health = 3 Fire = 0 Reactivity = 0 PPE = Supplied by User; dependent on local conditions					
Appearance: White					
Potential Acute Health Effects:					
Eye:	Contact produces irritation, tearing, and burning pain. May cause conjunctivitis.				



<b>Skin:</b>	Hazardous in case of skin contact (permeator). May be hazardous in case of skin contact (irritant). Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.
<b>Inhalation:</b>	Causes respiratory tract irritation; May cause effects similar to those described for ingestion.
<b>Ingestion:</b>	<b>Toxic!</b> May cause kidney damage. May cause severe digestive tract irritation with abdominal pain, nausea, vomiting and diarrhea; May cause hemorrhaging of the digestive tract; Barium chloride affects the muscles (especially the smooth muscles of the cardiovascular and respiratory systems), causes salivation, tingling of the mouth or face, convulsions, numbness, muscle paralysis, respiratory failure, slow pulse rate, pulmonary edema, irregular heart be at, potassium deficiency in the blood. <b>Estimated lethal dose in humans: 1 gram.</b>
<b>Potential Chronic Health Effects:</b> Repeated or prolonged exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.	
<b>Target Organs:</b> The substance is toxic to kidneys, the nervous system, peripheral nervous system, cardiovascular system, upper respiratory tract, central nervous system, muscles (CNS). The substance may be toxic to liver.	
<b>Aggravation of Pre-existing Conditions:</b> Persons with pre-existing skin disorders or impaired respiratory function may be more susceptible to the effects of the substance.	
Additional information See Toxicological Information (Section 11)	
<b>Section 4: First Aid Measures</b>	
<b>Eye Contact:</b>	Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of <b>water</b> for at least <b>15</b> minutes. Get medical attention.
<b>Skin:</b>	Remove any contaminated clothing. Wash the skin immediately with soap and water for at least <b>15</b> minutes. Get medical attention if irritation develops or persists. <b>Wash</b> clothing before reuse.
<b>Inhalation:</b>	Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician. Do NOT use mouth-to-mouth resuscitation.
<b>Ingestion:</b>	<b>Get medical attention immediately!</b> <b>Conscious:</b> If swallowed, immediately rinse mouth and drink plenty of water (200-300 ml). Do NOT induce vomiting. <b>Unconscious but Breathing:</b> Never give anything by mouth to an unconscious person.
<b>Notes to Physician:</b>	Monitor patients with significant ingestion for respiratory, cardiovascular, and blood pressure status. Watch for cardiac arrhythmias, respiratory failure due to flaccid paralysis of respiratory muscles, pulmonary edema, vocal cord paralysis, severe hypertension, and late effect kidney failure. Acute barium poisoning results in hypokalemia. The administration of fluids containing dilute concentrations of potassium salts may be indicated.
<b>Section 5: Fire and Explosion Data</b>	
<b>General Information:</b>	Only capable personnel who are trained and aware of the hazards of the product should do fire response. In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full face-piece operated in the pressure demand or other positive pressure mode.
<b>Extinguishing Media:</b>	Use any means suitable for extinguishing surrounding fire.
<b>Flammability of the Product:</b>	Non-flammable
<b>Auto-Ignition Temperature:</b>	Not Applicable
<b>Flash Points:</b>	Not Applicable
<b>Flammable Limits:</b>	Not Applicable
<b>Products of Combustion:</b>	Not Available
<b>Fire Hazards in Presence of Various Substances:</b> Not Applicable	
<b>Explosion Hazards in Presence of Various Substances:</b> No	



Risks of explosion of the product in presence of mechanical impact: Not Available  
 Risks of explosion of the product in presence of static discharge: Not Available  
 Fire Fighting Media and Instructions: Not Applicable  
 Special Remarks on Fire Hazards: Not Available  
 Special Remarks on Explosion hazards: Not Available

**Section 6: Accidental Release Measures**

<b>Personal Precautions:</b>	Use proper personal protective equipment as indicated in Section 8
<b>Small Spill:</b>	Use appropriate tools to put the spilled solid in a convenient waste disposal container.
<b>Large Spill:</b>	Poisonous solid. Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

**Section 7: Handling and Storage**

<b>Precautions:</b>	Use only in well-ventilated areas. <b>Avoid</b> contact with eyes, skin and clothing. <b>Do not</b> ingest. <b>Do not</b> breathe dust. <b>Wear</b> suitable protective clothing. <b>In</b> case of insufficient ventilation, wear suitable respiratory equipment. <b>If</b> you feel unwell, seek medical attention and show the label when possible. Keep away from incompatibles.
<b>Storage:</b>	<b>Keep</b> container tightly closed. <b>Keep</b> container in a cool, dry, well-ventilated area. <b>Keep</b> away from Incompatible products.
<b>Packaging material:</b>	Paper + PE coating.

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

<b>Engineering Controls:</b>	Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
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Exposure Limit Values--- Barium Chloride Dihydrate:		
Authorized limit Values	TLV ACGIH-USA (2006)	OSHA PEL NIOSH REL (1989)
Barium Chloride Dihydrate	On0.5mg/m <sup>3</sup> as Ba in soluble compounds of Ba	On0.5mg/m <sup>3</sup> as Ba in soluble compounds of Ba

<b>Occupational Exposure Controls:</b>	
<b>Ventilation:</b>	<b>Premises Ventilation.</b> Maintain employee exposures to levels below the applicable exposure limits.
<b>Respiratory Protection:</b>	In case of insufficient ventilation, wear suitable respiratory equipment. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N99 (US) or type P2 (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. <b>WARNING:</b> Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
<b>Hand Protection:</b>	Chemical protective gloves. Recommended materials: PVC, neoprene or rubber.
<b>Eyes:</b>	Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.
<b>Skin:</b>	Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
<b>Other Information:</b>	<b>Chemical</b> protective clothing in dusty areas. <b>An</b> eyewash and safety shower should be nearby and ready for use. <b>Use</b> good hygiene practices when handling this product including changing work clothes after use. <b>Do</b> not eat, drink or smoke in areas where this material is handled.

**Section 9: Physical and Chemical Properties**

<b>Physical state and appearance:</b>	Solid
<b>Appearance:</b>	White



Odor:	Odorless
<b>Important Health, Safety and Environmental Information:</b>	
pH:	5.0 - 8.0 (5% aq.solution)
Boiling Point:	1560°C (2,840°F) (Anhydrous)
Melting Point:	963°C (1,765°F)( Anhydrous)
Decomposition Temperature:	>100°C
Flash Point:	Not Applicable
Flammability:	Not Applicable
Explosive Properties:	Not Applicable Explosion Limits, Lower: Not Available Explosion Limits, Upper: Not Available
Oxidizing Properties:	Not Applicable
Vapor Pressure:	Not Applicable
Relative Density:	3.86 @ 24°C (75°F) (Anhydrous)
Solubility:	Soluble---31 g/100 g water @ 0°C (32°F) (Anhydrous)
Partition coefficient:	Not Listed
Viscosity:	Not Applicable
Vapor Density (air=1):	Not Applicable
Evaporation Rate:	Not Applicable
Granulometry:	Not Available
<b>Section 10: Stability and Reactivity Data</b>	
Stability:	Stable under ordinary conditions of use and storage.
Condition to Avoid:	Ignition sources, dust generation, excess heat, strong oxidants.
Materials and Substances to Avoid:	Strong oxidizing agents, bromine trifluoride, 2-furan + percarboxylicacid.
Hazardous decomposition products:	Hydrogen chloride, chlorine.
Corrosivity:	Non-corrosive in presence of glass.
Special Remarks on Reactivity:	Not Available
Special Remarks on Corrosivity:	Not Available
Polymerization:	Will not occur
<b>Section 11: Toxicological Information</b>	
Routes of Entry:	Eye contact, Inhalation, Ingestion.
Acute Toxicity:	ORL-RAT LD50: 118mg kg <sup>-1</sup> SCU-RAT LD50: 178mg kg <sup>-1</sup> IPR-MUS LD50: 54mg kg <sup>-1</sup>
Signs and Symptoms of Exposure:	Stomach pains, vomiting, and diarrhea. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.
Target Organ Information:	Heart. Nerves. Liver. Spleen. Bone marrow. G.I. System. Kidneys.
Potential Acute Health Effects:	May be hazardous in case of eye contact (irritant). Hazardous in case of skin contact (permeator). May be hazardous in case of skin contact (irritant). Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. Hazardous in case of inhalation. May be hazardous in case of inhalation (lung irritant). Extremely hazardous in case of ingestion. <b>May be fatal if swallowed.</b>
Potential Chronic Health Effects:	Repeated or prolonged exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.
Carcinogenic Effects:	Not Available
Mutagenic Effects:	Not Available
Teratogenic Effects:	Not Available
Developmental Toxicity:	Not Available



Special Remarks on Chronic Effects on Humans: Not Available  
 Special Remarks on other Toxic Effects on Humans: Not Available  
 Special Remarks on Toxicity to Animals: Not Available

**Section 12 - Ecological Information**

**Ecotoxicity:** Dangerous for aquatic organisms. Endangers drinking-water supplies if allowed to enter soil or water. Formation of health-hazardous mixtures possible with water.  
**Chronic Ecotoxicity:** No Data

**Biological effects:**  
 The following applies to barium compounds: biological effects: fish: lethal as from 158 mg/l; Salmon lethal as from 158 mg/l (as BaCl<sub>2</sub>); L. idus LC50: 870 mg/l (as BaCl<sub>2</sub>); barium ions toxic for aquatic organisms: algae: Sc. quadricauda toxic as from 34 mg/l; crustaceans: toxic as from 29 mg/l; hazard for drinking water!  
**Do not allow entering waters, wastewater, or soil!**

**Degradation:** The products of degradation are less toxic than the product itself.  
**Potential for Bioaccumulation:** This material is expected to significantly bioaccumulate.

**Special Remarks on the Products of Biodegradation:** Not available

**Section 13: Disposal Considerations**

**Waste Treatment:**  
 Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

**Packaging Treatment:**  
 Containers that cannot be cleaned must be treated as waste and disposed of in an approved industrial incineration facility.

**EPA Waste Number:**  
 D005 (barium containing waste)

**Section 14: Transport Information**

MODE	US DOT	IMDG	RID/ADR	IATA	CANADA TDG
<b>Shipping Name:</b>	Barium Compounds, N.O.S	Barium Compounds, N.O.S	Barium Compounds, N.O.S	Barium Compounds, N.O.S	Barium Compounds, N.O.S
<b>Hazard Class:</b>	6.1	6.1	6.1	6.1	6.1
<b>UN/NA:</b>	UN1564	UN1564	UN1564	UN1564	UN1564
<b>Packing Group:</b>	III	III	III	III	III
<b>Hazard Label (Subsidiary):</b>	Toxic	Toxic	Toxic	Toxic	Toxic
<b>Marine Pollutant:</b>	Yes	Yes	Yes	Yes	Yes
<b>Reportable Quantity:</b>	No	No	No	No	No

**Section 15 - Regulatory Information**

**CHEMICAL INVENTORY STATUS:**

Ingredient:	CAS No:	TSCA	EINECS	CHINA	JAPAN	AUSTRALIA	KOREA	PHIL	CANADA	
									DSL	NDSL
Barium Chloride Dihydrate	10326-27-9	YES	YES	NO	YES	YES	YES	YES	YES	NO

**US FEDERAL, STATE, INTERNATIONAL REGULATIONS**



TSCA 8(b) inventory: Barium Chloride Dihydrate  
 SARA 302/304/311/312 extremely hazardous substances: No products were found.  
 SARA 302/304 emergency planning and notification: No products were found.  
 SARA 302/304/311/312 hazardous chemicals: BARIUM CHLORIDE, DIHYDRATE  
 SARA 311/312 MSDS distribution – chemical inventory – hazard identification: BARIUM CHLORIDE, DIHYDRATE: Immediate (Acute) Health Hazard  
 SARA 313 toxic chemical notification and release reporting: No products were found.  
 Clean Water Act (CWA) 307: No products were found.  
 Clean Water Act (CWA) 311: No products were found.  
 Clean air act (CAA) 112 accidental release prevention: No products were found.  
 Clean air act (CAA) 112 regulated flammable substances: No products were found.  
 Clean air act (CAA) 112 regulated toxic substances: No products were found.  
**Chemical Weapons Convention: No** TSCA 12(b): No CDTA: No  
**NFPA (NATIONAL FIRE PROTECTION ASSOCIATION)**  
 Health = 3 Flammability = 0 Instability = 0 Special = None  
**HMIS (HAZARDOUS MATERIAL INFORMATION SYSTEM)**  
 Health = 3 Fire = 0 Reactivity = 0 PPE = Supplied by User; dependent on local conditions

**WHMIS (Canada) Class:**

**D1B:** Material causing immediate and serious toxic effects (Toxic)

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

**Canadian Ingredient Disclosure List:**

CAS# 10326-27-9 is not listed on the Canadian Ingredient Disclosure List.

**European Labeling in Accordance with EC Directives:**

ANNEX I INDEX NUMBER: 056-004-00-8

INDICATION OF DANGER: T (Toxic)

Symbol(s): T  MP 

**Risk Phrases:** R 20; R25---Harmful by inhalation. Toxic if swallowed.

**Safety Description:** S45---In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

**Germany:**

WGK: 1

ID-Number: 25

KBwS---Decision

**Australian Hazchem Code:** 2Z

**Poison Schedule:** S6

**Section 16 - Additional Information**

**Label Hazard Warning:** DANGER! MAY BE FATAL IF SWALLOWED. HARMFUL IF INHALED. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. AFFECTS MUSCLES (INCLUDING THE HEART), AND CENTRAL NERVOUS SYSTEM

**Label Precautions:** Avoid contact with eyes, skin and clothing. Avoid breathing dust. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

**Label First Aid:** If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention immediately

**MSDS Creation Date:** 05/30/2006

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