Zinc-Calcium Bromide Solution

1. Product and Company Identification

TETRA Technologies, Inc. 25025 I-45 North The Woodlands, TX 77380	CHEMTREC (24-Hr Emergency Response):	U.S. Toll Free (800) 424-9300 International +1 703-527-3887
	Poison Control:	(800) 222-1222
	Non-emergency Customer Service:	(281) 367-1983

Synonyms:	Zinc-Calcium Bromide, Liquid Zinc-Calcium Bromide
Chemical Family:	Inorganic Salt Solution
MSDS Creation Date:	08 Oct 96
MSDS Revision Date:	09 Apr 08

2. Hazards Identification

NFPA Ratings: (Scale 0-4)	Health: 2 Fire: 0 Reactivity: 0
EMERGENCY OVERVIEW:	**WARNING: Irritant; Marine Pollutant**; **Explosion potential** with mixtures containing potassium or sodium. Odorless, clear, colorless to amber liquid. May cause irritation to skin, eyes and respiratory system. Avoid breathing mists, contact with eyes, skin and clothing. Harmful if swallowed. Do not ingest. Keep container tightly closed. Wash thoroughly after handling. Keep container tightly closed. Wash thoroughly after handling. Use only with adequate ventilation.
Potential Health Effects	
Skin Contact:	Dermal sensitizer. Single, short exposure not likely to cause significant skin irritation. However, direct contact with solution may cause irritation, redness and pain, possibly severe. Additional effects may include blistering, erythema, exfoliation, ulceration, necrosis, and scarring.
Eye Contact:	May cause irritation of eyes with redness and pain and superficial injury. Additional effects may include tearing, eye discharge, conjunctivitis, and blurred vision.
Inhalation:	Inhalation may cause irritation to mucous membranes and respiratory system. Additional effects may include coughing, labored breathing, and shortness of breath.
Ingestion:	Ingestion may cause burning sensation in mouth and throat, yellowing of the skin and eyes, nausea, vomiting, diarrhea, blood in urine, inability to urinate, low blood pressure, blood disorders, kidney damage, liver damage, convulsions and unconsciousness.

3. Composition, Information on Ingredients

CAS Number	Wt. %	Ingredient Name
7789-41-5	18 - 21	Calcium Bromide
7699-45-8	53 - 56	Zinc Bromide

4. First Aid Measures

Skin Contact:	Remove contaminated clothing and shoes immediately. Wash affected area with soap or mild detergent, and large amounts of water. In cases of burns, cover lightly with sterile, dry dressing. Get medical attention immediately.
Eye Contact:	Immediately flush eyes thoroughly with large amounts of water for 15-20 minutes. Hold eyelids open during flushing. Get medical attention immediately.
Inhalation:	Remove from exposure area to fresh air. Obtain medical attention immediately.
Ingestion:	Do not attempt to give anything by mouth to an unconscious person. Get medical attention immediately.

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Notes to Physician:	Treat symptomatically and supportively. If ingested, consider gastric lavage. The decision as to whether the severity of poisoning requires administration of any antidote and actual dose required should be made by qualified medical personnel only. The following antidote(s) can be considered: Calcium disodium edentate/dextrose, intravenous Calcium disodium edentate/procaine, intramuscular Sodium chloride, oral, intravenous

5. Fire Fighting Measures

Flash Point:	Not applicable
Extinguishing Media:	Dry chemical or CO_2, water spray or regular foam.
Fire Fighting:	Move container(s) from fire area if you can do so without risk. Apply cooling water to sides of containers that are exposed to flames until well after the fire is out. Keep away from ends of drums and/or ends of tanks. Extinguish fire using agent suitable for type of surrounding fire and/or chemicals. Avoid breathing vapors. Keep upwind. Dike area to prevent runoff and contamination of water sources.
Fire and Explosion Hazard:	Negligible fire hazard when exposed to heat or flame.
Products of Combustion:	Thermal decomposition products may include acrid smoke and fumes of zinc oxides and hydrogen bromide.

6. Accidental Release Measures

Evacuation and Safety:	Wear appropriate protective gear for the situation. See personal protection information in Section 8.
Containment of Spill:	Do not touch spilled material. Stop leak if you can do so without risk. For larger spills, dig holding area such as a pond or pit for containment. Dike far ahead of spill for later disposal. Keep unnecessary people away. Isolate hazard area and deny entry. Minimize air borne spreading of vapors. Prevent entry into waterways, sewers, basements or confined areas.
Cleanup and Disposal:	Neutralize with lime, crushed limestone, or sodium bicarbonate to pH 7. For small spills, take up with sand or other non-combustible material. Use cement powder or fly ash to absorb liquid. Place material in covered, clean, dry container for disposal.

7. Handling and Storage

Handling:	Avoid skin and eye contact and breathing vapors. Wash thoroughly after handling. Launder contaminated clothing before reuse.
Storage:	Observe all federal, state, and local regulations when storing this product. Store in a covered, clean and dry container away from incompatible materials.

8. Exposure Controls/Personal Protection

Engineering Controls:	Provide local exhaust ventilation system. Where there is possibility of exposure, eye wash fountain and safety shower should be provided within the immediate work area for emergency use.
Exposure Limits: None	
Personal Protective Equipment (PPE)	
Eyes:	Wear safety glasses with side shields or safety goggles/shields.
Hands and Feet:	Wear appropriate chemical protective gloves and boots.
Body:	Wear appropriate protective (impervious) clothing.
Respiratory:	A respirator is not indicated under normal operating conditions. Use of a NIOSH approved respirator should be used based on contamination levels found in the

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	area. For Firefighting and Other Immediately Dangerous to Life or Health Conditions: Any self-contained breathing apparatus that has a full face-piece and is operated in a pressure-demand or other positive-pressure mode. Any supplied-air respirator that has a full face-piece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus (SCBA) operated in pressure-demand or other positive-pressure mode.

9. Physical and Chemical Properties

Description:	Colorless to yellow liquid
Odor:	Odorless
Boiling Point:	313°F (156°C) for 55% solution $ZnBr_2$, 19% $CaBr_2$
Melting Point:	Not Applicable
Specific Gravity (H_2O=1):	2.3 @ 77°F (25°C) for 55% solution $ZnBr_2$, 19% $CaBr_2$
Water Solubility:	Completely
pH:	5 – 6 (1:10 dilution)
Vapor Pressure:	Not Available

10. Stability and Reactivity

Stability and Reactivity:	Stable under normal temperatures and pressures. Can evolve hydrogen bromide and/or bromine when heated. Can evolve bromine gas under oxidizing conditions.
Incompatibilities:	Metals. Mixtures containing potassium or sodium produce a strong explosion on impact.
Hazardous Decomposition:	Decomposition products may include acrid smoke and fumes of zinc oxides and hydrogen bromide.
Polymerization:	Does not occur under normal temperatures and pressures.
Conditions to Avoid:	Contact with incompatible materials.

11. Toxicological Information

Toxicity Data:	Toxicity data not available for zinc-calcium bromide. Calcium Bromide: LD_{50}: 740 mg/kg, mouse, interperitoneal LD_{50}: 1580 mg/kg, mouse, subcutaneous See Registry of Toxic Effects of Chemical Substances (RTECS) file for mutagenic and tumorigenic data. Local Effects – Eye, mucous membrane and skin irritant Health Effects – Moderately toxic by ingestion. Slightly toxic by dermal absorption. Repeated or prolonged dermal exposure to zinc salts may cause dermatitis with erythematous, popular, and granulomatous reactions in susceptible individuals. Repeated or prolonged ingestion of zinc salts may cause digestive and/or renal disorders. Ingestion of large amounts of astringent zinc salts may cause a burning sensation in the mouth and throat, nausea, vomiting, diarrhea, hemolysis, hematuria, kidney damage with anuria, liver damage with jaundice, and possibly hypotension, convulsions, and unconsciousness.
Carcinogen Status:	OSHA – No NTP – No IARC – No

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12. Ecological Information

Solutions containing zinc bromide are considered **Marine Pollutants and Environmentally Hazardous**.

13. Disposal Information

Observe all federal, state, and local regulations when disposing of this substance.

14. Department of Transportation (DOT) Transport Information

Shipping Name:	Environmentally Hazardous Substances liquid, N.O.S., Class 9, UN 3082, PG III (contains Zinc Bromide) Marine Pollutant, RQ
ID Number:	UN 3082
Hazard Class or Division:	9
Packing Group:	III
Labeling Requirements:	Class 9 and Marine Pollutant
Packing Authorizations:	
Exceptions:	49 CFR § 173.203
Non-bulk Packing:	49 CFR § 173.203
Bulk Packing:	49 CFR § 173.241
Quantity Limitations:	
Passenger Aircraft:	none
Cargo Aircraft Only:	none

15. Regulatory Information

TSCA Status:	Yes
Marine Pollutant:	Yes
Reportable Quantity (zinc bromide):	1000 lb. (454 KG)
SARA Section 302:	No
SARA Section 304:	Yes
SARA Section 313:	Yes
CERCLA Section 103:	Yes
SARA Title III:	311, 312 – Acute Hazard
OSHA Process Safety:	No
California Proposition 65:	No ingredients found on the list

16. Other Information

Individuals handling this product should be informed of the recommended safety precautions and should have access to this information.

This information relates to the specific product designated and may not be valid for such product used in combination with any other materials or in any other processes. Such information is to the best of our knowledge and belief, accurate and reliable as of the date compiled. However, no representation, warranty or guarantee is made as to its accuracy, reliability, or completeness. It is the users' responsibility to satisfy themselves as to the suitability and completeness of such information for their own particular use. We do not accept liability for any loss or damage that may occur from the use of this information nor do we offer warranty against patent infringement.

TETRA Technologies, Inc. reserves the right to refuse shipment of this product to any consumer who fails to

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demonstrate the ability to consistently handle and use it safely and in compliance with all applicable laws, rules and regulations. Such demonstration may require on-site inspection of any or all storage, processing, packaging and other handling systems that come in contact with it.

Customers are responsible for compliance with local, state and federal regulations that may be pertinent in the storage, application and disposal of this product.