CHEMICAL PRODUCTS CORPORATION

MATERIAL SAFETY DATA SHEET

1. PRODUCT IDENTIFIER

NAME: Barium Carbonate - All Grades. Type FF, Type CFF, Type S, Type H, Type HA, Aqua Flow®, Micro-Flow®, and Photo Grade.

SYNONYMS: Carbonic Acid, Barium Salt.

MANUFACTURER: Chemical Products Corporation (CPC)
P.O. Box 2470
102 Old Mill Road, S.E.
Cartersville, Georgia 30120-1692
Telephone: Day, 770-382-2144; Night, 770-382-2212

EMERGENCY: CHEMTREC - 800-424-9300

2. INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>CAS #</th>
<th>EXPOSURE LIMITS</th>
<th>% BY WT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barium Carbonate</td>
<td>513-77-9</td>
<td>OSHA PEL: 0.5 mg/cu m as Ba&lt;br&gt;0.74 mg/cu m as This Product&lt;br&gt;ACGIH TLV-TWA: Same</td>
<td>ca 97.0</td>
</tr>
</tbody>
</table>

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: White powder or granules with no odor or very slight rotten egg odor. Absorbed from lungs or stomach into bloodstream. Causes muscle stimulation followed by transient paralysis.

POTENTIAL HEALTH EFFECTS: Stomach pain, vomiting, and diarrhea.

Routes of Entry: Ingestion; possibly inhalation.

Human Effects: Acute over-exposure will cause severe abdominal pain, violent purging with watery and bloody stools, vomiting, muscle twitching, and confusion, followed by transient muscle paralysis, including paralysis of the respiratory muscles, which may be fatal. Barium is eliminated from the body over several days. Chronic over-exposure may lead to varying degrees of paralysis of the extremities. Hypertension may also be present. Symptoms of over-exposure will disappear with time as the body eliminates barium, primarily in the feces. Hypokalemia is often observed; potassium should be administered - large doses may be required.

Chronic Inhalation: See Human Effects on Page 1.

Acute Skin Contact: Barium ion is not likely to penetrate intact skin; penetration through cuts and burns may produce symptoms of over-exposure.

Chronic Skin Contact: Barium ion is not likely to penetrate intact skin. A slight irritation of the skin may result from the alkaline nature of this product.

Acute Eye Contact: Particles in the eye will cause pain, tearing, and irritation.

Chronic Eye Contact: Particles in the eye will cause tearing and irritation.

Acute Ingestion: See Human Effects on Page 1.

Chronic Ingestion: See Human Effects on Page 1.

Carcinogenicity: NTP.........: 1993 study of barium chloride, a water-soluble barium salt, showed no evidence of carcinogenicity.

IARC.........: Not listed.

OSHA.......: Not regulated.

Medical Conditions Aggravated by Exposure: None are known.

4. FIRST AID MEASURES

Ingestion: Have victim drink one tablespoon of Epsom Salts (magnesium sulfate) or Glauber's Salt (sodium sulfate) dissolved in water. If victim is not vomiting, induce vomiting by giving Syrup of Ipecac or by sticking finger down throat. Repeat the entire procedure described above. Call for prompt medical attention. Physician should administer potassium.

Inhalation: Flush mouth and nasal passages with water. Have victim drink one tablespoon of Epsom Salts (magnesium sulfate) or Glauber's Salt (sodium sulfate) dissolved in water. Call for prompt medical attention.

Eye Contact: Flush eyes with large amounts of water until irritation subsides. Get medical attention.

Skin Contact: Wash with water and use soap if available. Remove severely contaminated clothing and wash before reuse.
5. FIRE FIGHTING MEASURES

**Flashpoint**: Non-Flammable.

**Flammability**: Non-Flammable.

**Autoignition**: Non-Flammable.

**General Hazard**: No fire hazard. Will decompose releasing carbon dioxide gas at extremely high temperatures. This product is toxic if ingested.

**Fire Fighting Instructions**: Limit water runoff if it is likely to contain suspended barium carbonate. Add soluble sulfate such as sodium sulfate to the water to make it non-hazardous.

**Fire Fighting Equipment**: No special equipment is required. Wash away any barium carbonate which may contact the body, clothing, or equipment.

**Hazardous Combustion Products**: None.

6. ACCIDENTAL RELEASE MEASURES

**Small Spill**: Try to keep material dry. Mix with excess sulfate to make material non-hazardous.

**Large Spill**: Try to keep material dry. Prevent runoff from entering storm sewers or ditches which lead to natural waterways. Dispose of spilled material in an approved hazardous waste landfill or mix with excess sulfate to make material non-hazardous.

7. HANDLING AND STORAGE

**Storage Temperature**: Not critical.

**Storage Pressure**: Not critical.

**General**: This product is not water-soluble, but is soluble in most acids. Keep this material dry. Keep containers closed. Emptied containers may present a toxic hazard; treat or dispose of appropriately.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

**Engineering Controls**: Control airborne concentrations below the exposure limits. Use only with adequate ventilation.
Respiratory Protection: Use a NIOSH-approved dust mask if excessive dust is present.

Skin Protection: Cover exposed skin areas and wear general-purpose gloves.

Eye Protection: Wear safety glasses. Use chemical goggles if excessive dust is present.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Solid.

Vapor Pressure: Not applicable.

Specific Gravity: 3.1

Solubility in Water: Insoluble.

pH: 1% suspension in water has a pH of 9.

Boiling Point: Decomposes to barium oxide and carbon dioxide at about 1000 Deg. C.

Melting Point: About 1000 Deg. C. - Near decomposition temperature.

Vapor Density: Not applicable.

Evaporation Rate: Not applicable.

Odor: Usually odorless; possibly a very slight rotten-egg odor.

Appearance: White powder or granules.

10. STABILITY AND REACTIVITY

Chemical Stability: Keep away from intense heat which may cause decomposition. Keep away from acids which will cause decomposition.

Incompatibility: Acids will decompose barium carbonate with the liberation of carbon dioxide.

Hazardous Decomposition Products: Barium carbonate may be decomposed to carbon dioxide gas which is hazardous in confined spaces and another barium salt which may be toxic depending upon its degree of solubility in water or acid.

Hazardous Polymerization: Does not occur.
11. TOXICOLOGICAL INFORMATION

**Skin:** Contact may be slightly irritating. Barium ion is not expected to pass through intact skin.

**Eyes:** The dust is expected to be slightly to moderately irritating.

**Ingestion:** Barium carbonate is converted to barium chloride in the stomach. The Oral LD50 for rats is about 400 mg/kg of barium chloride. A National Toxicology Program study found no decrease in two-year survival for rats consuming 110 mg/kg/day of barium chloride for the entire two year period.

**Inhalation:** No studies. Inhaled dust is expected to exhibit the same systemic toxicity as ingestion because barium carbonate is cleared from the lungs into the bloodstream.

**Sub-chronic:** Rats and mice exposed to 1,250 ppm of barium chloride dihydrate in their drinking water continuously for two years showed no adverse effects.

**Chronic/Carcinogenic:** Rats and mice exposed to 2500 ppm of barium chloride dihydrate in drinking water for two years showed no evidence of carcinogenic response.

**Teratogenic:** Rats exposed to 2000 ppm of barium chloride dihydrate in their drinking water for thirty days exhibited no teratogenic effects, and no fetotoxicity was noted.

**Reproductive:** No effects were seen on reproductive indices in a mating trial after male rats were exposed to 2000 ppm of barium chloride dihydrate in their drinking water for sixty days and female rats were exposed to 2000 ppm in their drinking water for thirty days.

**Mutagenic:** Barium chloride dihydrate was not mutagenic in Salmonella typhimurium strains TA 100, TA 1535, TA 1537, TA 97, or TA 98, with or without exogenous metabolic activation (S9).

12. ECOLOGICAL INFORMATION

**TOXICITY:** In turbid water at 20 Deg. C, the 96 hour TLM has been reported as 10,000 mg/l for Mosquito Fish (Gambusia Affinis). This would have been suspended rather than dissolved.

**DISTRIBUTION:** Barium carbonate is not water soluble and occurs in nature as the mineral witherite. It reacts with sulfate ions in the environment to form barium sulfate. No appreciable bioconcentration is expected in the environment because barium sulfate is naturally present in almost all rocks and soils.

**CHEMICAL FATE:** Barium carbonate is expected to react with sulfate in the environment to form barium sulfate which is insoluble in both water and acids, and thus is inert and non-toxic.
13. WASTE MANAGEMENT INFORMATION

Waste containing more than 0.2% soluble barium is hazardous under the RCRA criteria. If disposed of in its purchased form, this product would be a hazardous waste based on barium solubility in the RCRA TCLP test. Barium compounds can be rendered non-hazardous by reaction with excess sulfate to form insoluble barium sulfate. Any disposal practice must be in compliance with local, state, and federal laws and regulations.

14. TRANSPORT INFORMATION

D.O.T. Shipping Name: Not Regulated.

Technical Shipping Name: Barium Compound.

D.O.T. Hazard Class: None.

U.N./N.A. Number: None.

Product R.Q. (lbs): None.

D.O.T. Label: None.

D.O.T. Placard: None.

Freight Class Bulk: Inorganic Chemical.

Freight Class Package: Inorganic Chemical.

Product Label: Barium Carbonate, Precipitated: Type FF, Type CFF, Type S, Type HA, Type H, Aqua-Flo®, Micro-Flo®, or Photo Grade.

15. REGULATORY INFORMATION

OSHA Status: This product is hazardous under the criteria of the Federal OSHA Hazard Communication Standard, 29 CFR 1910.1200. It is classified as toxic based on the oral rat LD50.

TSCA Status: Listed on TSCA Inventory
CERCLA Reportable Quantity: None.

SARA Title III:
Section 302, Extremely Hazardous Substances: None.
Section 311/312, Hazard Categories: Category 1 (Acute Hazard).
Section 313, Toxics Release Inventory: Barium Compounds, Code N040.

RCRA Status: If discarded in its purchased form, this product would be a hazardous waste by characteristic. Under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste under 40 CFR 261.20-24.

16. OTHER INFORMATION

NFPA Rating (National Fire Protection Association):

Health - 2 (Materials which on intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical attention is given).
Fire - 0 (Materials that are non-flammable).
Reactivity - 0 (Materials which in themselves are normally stable even under fire exposure conditions, and which are not reactive with water).

Special - NA

Reason for Issue: Change in Area Code.

Prepared by: Jerry A. Cook.

Title: Technical Director.

Approval Date: September, 1995.

Supercedes Date: April, 1995.

MSDS Number: 44.

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