Distributed By:
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SAFETY DATA SHEET
North American Version

BARIUM CARBONATE

1. PRODUCT AND COMPANY IDENTIFICATION

1.1. Identification of the substance or mixture

Product name	:	BARIUM CARBONATE
Product grade(s)	:	A , B , C , D Barium Carbonate Granular Barium Carbonate Powder
Chemical Name	:	Barium carbonate
Synonyms	:	Barium salt
Molecular formula	:	$BaCO_3$
Molecular Weight	:	197.3 g/mol

1.2. Use of the Substance/Mixture

Recommended use :

- Use in the manufacturing of other barium substances
- Use as reactive processing aid (sulfate removal)
- Glass industry
- Manufacture of ceramic materials
- Manufacture of electro-ceramic materials
- Manufacture of glazes, frits and enamels
- Use in welding electrode coating
- Use in the preparation of slurry
- Manufacture of pyrotechnical products
- Welding in industrial and professional settings
- For further information, please contact: Supplier

1.3. Company/Undertaking Identification

Address : SOLVAY CHEMICALS, INC.
3333 RICHMOND AVENUE
HOUSTON TX 77098-3099
United States

1.4. Emergency and contact telephone numbers

Emergency telephone number	:	**1 (800) 424-9300 CHEMTREC ® (USA & Canada)** **01-800-00-214-00 (MEX. REPUBLIC)**
Contact telephone number (product information):	:	**US: +1-800-765-8292 (Product information)** **US: +1-713-525-6500 (Product information)**

2. HAZARDS IDENTIFICATION

2.1. Emergency Overview:

NFPA	:	H= 2 F= 0 I= 1 S= None
HMIS	:	H= 2 F= 0 R= 1 PPE = Supplied by User; dependent on local conditions

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General Information

Appearance	:	powder, pellets
Colour	:	white
Odour	:	odourless

2.2. Potential Health Effects:

Inhalation
- May cause irritation of the mucous membranes.

Eye contact
- Contact with eyes may cause irritation.

Skin contact
- Prolonged skin contact may cause skin irritation.

Ingestion
- Acute intoxication by inhalation or ingestion of water soluble barium salts causes vomiting, diarrhoea, convulsive tremors and muscular paralysis.
- Risk of convulsions, pulmonary arrest.
- Risk of cardiac rhythm alteration, sudden cardiac failure.
- Risk of shock.

Other toxicity effects
- See section 11: Toxicological Information

2.3. Environmental Effects:
- See section 12: Ecological Information

3. COMPOSITION/INFORMATION ON INGREDIENTS

Barium carbonate

CAS-No.	:	513-77-9
Concentration	:	**>= 97.0 %**

4. FIRST AID MEASURES

4.1. Inhalation
- Move to fresh air.
- If symptoms persist, call a physician.

4.2. Eye contact
- Rinse thoroughly with plenty of water, also under the eyelids.
- If eye irritation persists, consult a specialist.

4.3. Skin contact
- Remove and wash contaminated clothing before re-use.
- Wash off with plenty of water.
- If symptoms persist, call a physician.

4.4. Ingestion
- Call a physician immediately.
- Take victim immediately to hospital.
- If swallowed, rinse mouth with water (only if the person is conscious).
- Artificial respiration and/or oxygen may be necessary.

4.5. Notes to physician

Exposure to decomposition products :

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- Give to drink 30 grams of sodium sulphate in 250 ml of fresh water.
- Immediate medical attention is required.
- Medical examination necessary even only on suspicion of intoxication.

5. FIREFIGHTING MEASURES

5.1. Suitable extinguishing media

- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

5.2. Extinguishing media which shall not be used for safety reasons

- None.

5.3. Special exposure hazards in a fire

- Not combustible.

5.4. Hazardous decomposition products

- Barium oxide
- Other hazardous decomposition products may be formed.

5.5. Special protective equipment for firefighters

- In the event of fire, wear self-contained breathing apparatus.
- Use personal protective equipment.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. Advice for non-emergency personnel

- Evacuate personnel to safe areas.

6.1.2. Advice for emergency responders

- Use personal protective equipment.
- Prevent further leakage or spillage.

6.2. Environmental precautions

- Should not be released into the environment.
- Local authorities should be advised if significant spillages cannot be contained.

6.3. Methods and materials for containment and cleaning up

- Pick up and transfer to properly labelled containers.
- Keep in suitable, closed containers for disposal.

6.4. Reference to other sections

- Refer to protective measures listed in sections 7 and 8.

7. HANDLING AND STORAGE

7.1. Handling

- Ensure adequate ventilation.
- Avoid contact with skin and eyes.

7.2. Storage

- Store in original container.
- Keep in a well-ventilated place.
- Keep in a dry place.
- Keep in properly labelled containers.
- Keep container closed.

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- Keep away from Incompatible products.

7.3. Packaging material

- Paper + PE.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Exposure Limit Values

Barium carbonate

- US. ACGIH Threshold Limit Values 2009
  time weighted average = 0.5 mg/m3
  Remarks: as Ba
- US. OSHA Table Z-1-A (29 CFR 1910.1000) 1989
  time weighted average = 0.5 mg/m3
  Remarks: as Ba
- US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) 02 2006
  Permissible exposure limit = 0.5 mg/m3
  Remarks: as Ba
- US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A 06 2008
  time weighted average = 0.5 mg/m3
  Remarks: as Ba

Strontium carbonate

- US. ACGIH Threshold Limit Values
  Remarks: none established

Barium sulfate

- US. ACGIH Threshold Limit Values 12 2010
  time weighted average = 10 mg/m3
- US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) 02 2006
  Permissible exposure limit = 5 mg/m3
- US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000) 02 2006
  Permissible exposure limit = 15 mg/m3
- US. OSHA Table Z-1-A (29 CFR 1910.1000) 1989
  time weighted average = 5 mg/m3
- US. OSHA Table Z-1-A (29 CFR 1910.1000) 1989
  time weighted average = 10 mg/m3
- US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A 06 2008
  time weighted average = 5 mg/m3
  Remarks: respirable dust fraction
- US. Tennessee. OELs. Occupational Exposure Limits, Table Z1A 06 2008
  time weighted average = 10 mg/m3
  Remarks: Total dust

ACGIH® and TLV® are registered trademarks of the American Conference of Governmental Industrial Hygienists.
SAEL = Solvay Acceptable Exposure Limit, Time Weighted Average for 8 hour workdays. No Specific TLV STEL (Short Term Exposure Level) has been set. Excursions in exposure level may exceed 3 times the TLV TWA for no more than a total of 30 minutes during a workday and under no circumstances should they exceed 5 times the TLV TWA.

8.2. Engineering controls

- Apply technical measures to comply with the occupational exposure limits.

8.3. Personal protective equipment

8.3.1. Respiratory protection

- In case of insufficient ventilation, wear suitable respiratory equipment.
- Self-contained breathing apparatus (EN 133)

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- Respirator with a dust filter
- Use only respiratory protection that conforms to international/ national standards.
- Use NIOSH approved respiratory protection.

8.3.2. Hand protection

- Impervious gloves
- Suitable material: PVC, Neoprene, Natural Rubber

8.3.3. Eye protection

- Dust proof goggles, if dusty.

8.3.4. Skin and body protection

- Long sleeved clothing

8.3.5. Hygiene measures

- Eye wash bottles or eye wash stations in compliance with applicable standards.
- When using do not eat, drink or smoke.
- Wash hands before breaks and at the end of workday.
- Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. General Information

Appearance	:	powder, pellets
Colour	:	white
Odour	:	odourless

9.2. Important health safety and environmental information

pH	:	5 - 7
Boiling point/boiling range	:	*Remarks*: not applicable, Thermal decomposition
Flash point	:	*Remarks*: not applicable
Flammability	:	*Remarks*: The product is not flammable.
Explosive properties	:	*Explosion danger*: *Remarks*: Not explosive
Oxidizing properties	:	*Remarks*: Non oxidizer
Vapour pressure	:	*Remarks*: not applicable
Relative density / Density	:	4.31
Bulk density	:	from 400 - 2,000 kg/m3
Solubility(ies)	:	14 mg/l (Water) *Temperature*: 20 °C (68 °F)
Partition coefficient: n-octanol/water	:	*Remarks*: not applicable
Vapour density	:	*Remarks*: not applicable
Evaporation rate	:	*Remarks*: not applicable

9.3. Other data

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Melting point/range	:	>= 900 °C (1,652 °F) *Remarks*: Thermal decomposition
Auto-flammability	:	*Remarks*: not applicable
Granulometry	:	2.32 - 14.6 µm (powder) *Remarks*: d 50
Decomposition temperature	:	1,380 °C (2,516 °F)

10. STABILITY AND REACTIVITY

10.1. Stability
- Stable under recommended storage conditions.

10.2. Conditions to avoid
- none
- Keep at temperature not exceeding: 1,380 °C (2,516 °F)

10.3. Materials to avoid
- Acids

10.4. Hazardous decomposition products
- Barium oxide, Other hazardous decomposition products may be formed.

11. TOXICOLOGICAL INFORMATION

Toxicological data

Acute oral toxicity
- LD50, rat, < 300 mg/kg (Barium chloride anhydrous)
- LD50, rat, > 300 mg/kg, Remarks: practically insoluble

Acute inhalation toxicity
- LC50, , Remarks: study scientifically unjustified

Acute dermal irritation/corrosion
- LD50, rat, > 2,000 mg/kg (Barium chloride anhydrous)

Skin irritation
- rabbit, No skin irritation

Eye irritation
- rabbit, No eye irritation

Sensitisation
- Did not cause sensitization. (Barium chloride anhydrous)

Chronic toxicity
- Inhalable dust, Repeated exposure, rat, Target Organs: cardio-vascular system, hematology system, Respiratory system, NOEL: 5.2 mg/m3, observed effect
- Inhalable dust, NOEL: 1 mg/m3, NOAEL
- Oral, Repeated exposure, rat/mouse, Target Organs: cardio-vascular system, hematology system, renal system, adrenal glands, NOEL: 87.8 mg/kg, NOAEL

Carcinogenicity
- Oral, Prolonged exposure, rat/mouse, Animal testing did not show any carcinogenic effects., (Barium chloride anhydrous)

Genetic toxicity in vitro
- in vitro, Animal testing did not show any mutagenic effects. (Barium chloride anhydrous)

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Reproductive toxicity

- Effect on fertility, Repeated exposure, Target Organs**:** Oral, 258 - 290 mg/kg, NOAEL, (Barium chloride anhydrous)

Remarks

- Harmful if swallowed.
- The toxicity is mainly linked to the barium ion (nervous, cardiovascular, respiratory and gastro-intestinal troubles).
- Risk of effect on the liver, the cardiovascular system, the hematological system and the adrenals
- Irritating to eyes and skin.

12. ECOLOGICAL INFORMATION

12.1. Ecotoxicity effects

Acute toxicity

- Remarks: Aquatic toxicity is unlikely due to low solubility.
- Fishes, Brachydanio rerio, LC50, 96 h, > 152 mg/l (Barium chloride anhydrous)
- Crustaceans, Daphnia magna, LC50, 48 h, 14.5 mg/l (Barium chloride anhydrous)

Chronic toxicity

- Crustaceans, Daphnia magna, EC50, 21 Days, 2.9 mg/l
- Pseudokirchneriella subcapitata (green algae), growth rate, 72 h, >= 61 mg/l
  Remarks: NOEC
- Pseudokirchneriella subcapitata (green algae), EC50, growth rate, 72 h, > 100 mg/l

12.2. Mobility

- Air
  Remarks: mobility as solid aerosols
- Water/soil
  Remarks: low solubility and mobility

12.3. Persistence and degradability

Abiotic degradation

- Water/soil
  Result: slow ionization and cation precipitation in presence of sulfates or carbonates

Biodegradation

- Remarks: The methods for determining biodegradability are not applicable to inorganic substances.

12.4. Bioaccumulative potential

- Bioconcentration
  Result: potential accumulation of the cation

12.5. Other adverse effects

- no data available

12.6. Remarks

- Ecological injuries are not known or expected under normal use.
- Persistent product mainly in its inert form.

13. DISPOSAL CONSIDERATIONS

13.1. Waste from residues / unused products

- In accordance with local and national regulations.
- Use a solution of sodium or magnesium sulphate or possibly a dilute solution of sulphuric acid to form a sulphate precipitate.

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- Dispose of wastes in an approved waste disposal facility.

13.2. Packaging treatment

- Containers that cannot be cleaned must be treated as waste.
- Must be incinerated in a suitable incineration plant holding a permit delivered by the competent authorities.

13.3. RCRA Hazardous Waste

- Listed RCRA Hazardous Waste (40 CFR 302) - No
- Unlisted RCRA Hazardous Waste (40 CFR 302) - Yes
- D005 (barium containing waste)

14. TRANSPORT INFORMATION

- not regulated

15. REGULATORY INFORMATION

15.1. Inventory Information

Toxic Substance Control Act list (TSCA)	: -	In compliance with inventory.
Australian Inventory of Chemical Substances (AICS)	: -	In compliance with inventory.
Canadian Domestic Substances List (DSL)	: -	In compliance with inventory.
Korean Existing Chemicals Inventory (KECI (KR))	: -	In compliance with inventory.
EU list of existing chemical substances (EINECS)	: -	In compliance with inventory.
Japanese Existing and New Chemical Substances (MITI List) (ENCS)	: -	In compliance with inventory.
Inventory of Existing Chemical Substances (China) (IECS)	: -	In compliance with inventory.
Philippine Inventory of Chemicals and Chemical Substances (PICCS)	: -	In compliance with inventory.
New Zealand Inventory of Chemicals (NZIOC)	: -	In compliance with inventory.

15.2. Other regulations

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A)

- not regulated.

SARA Hazard Designation (SARA 311/312)

- Acute Health Hazard: Yes.

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required

- not regulated.

US. EPA CERCLA Hazardous Substances (40 CFR 302)

- not regulated.

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US. New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)
- yes.

US. Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)
- yes.

US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)
- not regulated.

16. OTHER INFORMATION

Ratings :

NFPA (National Fire Protection Association)
Health = 2 Flammability = 0 Instability = 1 Special =None

HMIS (Hazardous Material Information System)
Health = 2 Fire = 0 Reactivity = 1 PPE : Supplied by User; dependent on local conditions

Further information
- Update
  This data sheet contains changes from the previous version in section(s): 8 , 11 , 12 , 15
- Distribute new edition to clients

Material Safety Data Sheets contain country specific regulatory information; therefore, the MSDS's provided are for use only by customers of the company mentioned in section 1 in North America. If you are located in a country other than Canada, Mexico or the United States, please contact the Solvay Group company in your country for MSDS information applicable to your location.

The previous information is based upon our current knowledge and experience of our product and is not exhaustive. It applies to the product as defined by the specifications. In case of combinations or mixtures, one must confirm that no new hazards are likely to exist. In any case, the user is not exempt from observing all legal, administrative and regulatory procedures relating to the product, personal hygiene, and integrity of the work environment. (Unless noted to the contrary, the technical information applies only to pure product).

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