BARIUM CARBONATE - HIGH PURITY BM020

Revision Date 12/19/2017

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

- Trade name: BARIUM CARBONATE - HIGH PURITY BM020
- Chemical name: Barium carbonate
- Synonyms: Barium salt
- Molecular formula: $BaCO_3$

1.2 Relevant identified uses of the substance or mixture and uses advised against

- no data available

1.3 Details of the supplier of the safety data sheet

Company

SOLVAY FLUORIDES, LLC
3737 Buffalo Speedway,
Suite 800,
Houston, TX 77098
USA
Tel: 800-515-6065

1.4 Emergency telephone

FOR EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT CONTACT: CHEMTREC 800-424-9300 within the United States and Canada, or 703-527-3887 for international collect calls.

SECTION 2: Hazards identification

Although OSHA has not adopted the environmental portion of the GHS regulations, this document may include information on environmental effects.

2.1 Classification of the substance or mixture

HCS 2012 (29 CFR 1910.1200)

Acute toxicity, Category 4	H302: Harmful if swallowed.

2.2 Label elements

HCS 2012 (29 CFR 1910.1200)

Pictogram

Signal Word

- Warning

Hazard Statements

- H302 Harmful if swallowed.

Precautionary Statements

Prevention

- P264 Wash skin thoroughly after handling.

- P270 Do not eat, drink or smoke when using this product.

Response

- P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.

2.3 Other hazards which do not result in classification

- H401: Toxic to aquatic life.
- None known.

SECTION 3: Composition/information on ingredients

3.1 Substance

- Not applicable, this product is a mixture.

3.2 Mixture

- Synonyms Barium salt
- Formula $BaCO_3$

Hazardous Ingredients and Impurities

Chemical name	Identification number CAS-No.	Concentration [%]
Barium carbonate	513-77-9	97.5
Citric Acid	77-92-9	2

SECTION 4: First aid measures

4.1 Description of first-aid measures

In case of inhalation

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

In case of skin contact

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

In case of eye contact

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

In case of 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.

4.2 Most important symptoms and effects, both acute and delayed

In case of inhalation

Effects

- May cause irritation of the mucous membranes.
- Risk of pulmonary overload (respirable particulates)
- Possible risk of irreversible effects through inhalation.

In case of skin contact

Effects

- Prolonged skin contact may cause skin irritation.

In case of eye contact

Effects

- Contact with eyes may cause irritation.

In case of ingestion

Effects

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

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician

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

SECTION 5: Firefighting measures

Flash point	Not applicable
	does not flash
Autoignition temperature	Not applicable
Flammability / Explosive limit	no data available

5.1 Extinguishing media

Suitable extinguishing media

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

Unsuitable extinguishing media

- None.

5.2 Special hazards arising from the substance or mixture

Specific hazards during fire fighting

- Not combustible.

Hazardous combustion products:

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

5.3 Advice for firefighters

Special protective equipment for fire-fighters

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

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for emergency responders

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

Advice for non-emergency personnel

- Evacuate personnel to safe areas.
- Avoid dust formation.

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 labeled containers.
- Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

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

SECTION 7: Handling and storage

7.1 Precautions for safe handling

- Use only in well-ventilated areas.

Hygiene measures

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

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/Storage conditions

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

- Keep away from:
- Incompatible products

Packaging material

Suitable material

- Paper.

- Polyethylene

7.3 Specific end use(s)

- Contact your supplier for additional information

SECTION 8: Exposure controls/personal protection

Introductory Remarks: These recommendations provide general guidance for handling this product. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Assistance with selection, use and maintenance of worker protection equipment is generally available from equipment manufacturers.

8.1 Control parameters

Components with workplace occupational exposure limits

Ingredients	Value type	Value	Basis
Barium carbonate	TWA	0.5 mg/m3	Occupational Safety and Health Administration - Table Z-1 Limits for Air Contaminants
	Expressed as :Barium		
Barium carbonate	TWA	0.5 mg/m3	American Conference of Governmental Industrial Hygienists
	Expressed as :Barium		
Barium carbonate	TWA	0.5 mg/m3	National Institute for Occupational Safety and Health
	Expressed as :Barium		

NIOSH IDLH (Immediately Dangerous to Life or Health Concentrations)

Ingredients	CAS-No.	Concentration
Barium carbonate	513-77-9	50 milligram per cubic meter

8.2 Exposure controls

Control measures

Engineering measures
- Ensure adequate ventilation.
- Apply technical measures to comply with the occupational exposure limits.

Individual protection measures

Respiratory protection
- In case of insufficient ventilation, wear suitable respiratory equipment.
- Respirator with a dust filter
- Use only respiratory protection that conforms to international/ national standards.
- Recommended Filter type: P3 filter
- Use NIOSH approved respiratory protection.

Hand protection
- Impervious gloves

Suitable material
- PVC
- Natural Rubber

Eye protection
- Safety glasses with side-shields
- Dust proof goggles, if dusty.

Skin and body protection
- Long sleeved clothing

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

SECTION 9: Physical and chemical properties

Physical and Chemical properties here represent typical properties of this product. Contact the business area using the Product information phone number in Section 1 for its exact specifications.

9.1 Information on basic physical and chemical properties

Appearance	Form: Crystalline powder Physical state: solid Color: white Particle size: 2.32 µm d 50
Odor	odorless
Odor Threshold	no data available
Molecular weight	197.3 g/mol
pH	5.0 - 7.0 (68 °F (20 °C))
	pKa: Not applicable
Melting point/freezing point	Melting point/range: >= 1652 °F (>= 900 °C) (0.76 mmHg (1.013 hPa)) Decomposition: yes
	>= 1652 °F (>= 900 °C) (759.81 mmHg (1,013 hPa))
Initial boiling point and boiling range	Boiling point/boiling range: 2,840 °F (1,560 °C) Thermal decomposition: yes
Flash point	Not applicable
	does not flash
Evaporation rate (Butylacetate = 1)	Not applicable
Flammability (solid, gas)	The product is not flammable.
Flammability / Explosive limit	Explosiveness: Not explosive
Autoignition temperature	Not applicable
Vapor pressure	Not applicable
Vapor density	Not applicable
Density	Bulk density: 300 - 600 kg/m3
Relative density	4.31 (68 °F (20 °C))

Solubility	Water solubility: 14 mg/l (68 °F (20 °C)) Solubility in other solvents: Hydrogen chloride : soluble Nitric acid : soluble Ethanol : soluble Sulphuric acid : insoluble
Partition coefficient: n-octanol/water	Not applicable
Decomposition temperature	2,516 °F (1,380 °C)
Viscosity	Viscosity, dynamic : Not applicable
Explosive properties	Not explosive
Oxidizing properties	Not considered as oxidizing.

9.2 Other information

no data available

SECTION 10: Stability and reactivity

10.1 Reactivity

- Contact with acids liberates CO2, sometimes violently.

10.2 Chemical stability

- Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

- No dangerous reaction known under conditions of normal use.

10.4 Conditions to avoid

- none

10.5 Incompatible materials

- Acids

10.6 Hazardous decomposition products

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

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Acute oral toxicity

Barium carbonate

LD50 : 1,690 mg/kg - Rat , male and female
Method: OECD Test Guideline 401
This product is classified as acute toxicity category 4

Acute inhalation toxicity

no data available

Acute dermal toxicity

Barium carbonate

By analogy

LD50 : > 2,000 mg/kg - Rat
Method: OECD Test Guideline 402
Not classified as hazardous for acute dermal toxicity according to GHS.

Acute toxicity (other routes of administration)

no data available

Skin corrosion/irritation

Barium carbonate

By analogy

No skin irritation
Method: OECD Test Guideline 439
Unpublished internal reports

Serious eye damage/eye irritation

Barium carbonate

Rabbit
No eye irritation
Method: OECD Test Guideline 405
Unpublished internal reports

Respiratory or skin sensitization

Barium carbonate

By analogy

Local lymph node assay - Mouse
Does not cause skin sensitization.
Method: OECD Test Guideline 429
Unpublished internal reports

Mutagenicity

Genotoxicity in vitro

Barium carbonate	By analogy Ames test with and without metabolic activation negative Method: OECD Test Guideline 471 Published data In vitro tests did not show mutagenic effects By analogy Chromosome aberration test in vitro Strain: CHO with and without metabolic activation negative Method: OECD Test Guideline 473 Published data In vitro tests did not show mutagenic effects Gene mutation assays in mammalian cells. Strain: Mouse with and without metabolic activation negative Method: OECD Test Guideline 476 Published data In vitro tests did not show mutagenic effects
Genotoxicity in vivo	no data available

Carcinogenicity

Barium carbonate	By analogy Rat Oral Exposure duration: 2 y NOAEL: 91mg/kg No carcinogenic effects have been observed Published data By analogy Mouse Oral Exposure duration: 2 y NOAEL: 91mg/kg No carcinogenic effects have been observed Published data

This product does not contain any ingredient designated as probable or suspected human carcinogens by:
NTP
IARC
OSHA

Toxicity for reproduction and development

Toxicity to reproduction / fertility

Barium carbonate	By analogy Oral Fertility NOAEL Parent: 258 - 290 mg/kg Published data By analogy Oral Fertility NOAEL Parent: 258 - 290 mg/kg Published data

Developmental Toxicity/Teratogenicity

Barium carbonate	By analogy Oral General Toxicity Maternal NOAEL: >= 16.9 mg/kg Teratogenicity NOAEL:>= 56.2mg/kg Method: OECD Test Guideline 414 Test substance, Barium, Unpublished internal reports

STOT

STOT-single exposure

Barium carbonate	The substance or mixture is not classified as specific target organ toxicant, single exposure according to GHS criteria.

STOT-repeated exposure

Barium carbonate	The substance or mixture is not classified as specific target organ toxicant, repeated exposure according to GHS criteria.
Barium carbonate	Inhalation 90 Days - Rat , male and female NOAEL: 61 - 81 mg/kg Test substance: Barium Target Organs: Cardio-vascular system, hematology system, Adrenal gland Published data Oral 90 Days - Mouse , male and female NOAEL: 61 - 81 mg/kg Test substance: Barium Target Organs: Cardio-vascular system, hematology system, Adrenal gland Published data Oral Repeated exposure - Mouse Target Organs: Cardio-vascular system, hematology system, Kidney, Adrenal gland Oral 92 Days - Rat NOAEL: 61 - 81 ppm Test substance: Barium Target Organs: Cardio-vascular system, hematology system, Kidney, Adrenal

gland

Oral 92 Days - Mouse
NOAEL: 61 - 81 ppm
Test substance: Barium
Target Organs: Cardio-vascular system, hematology system, Kidney, Adrenal gland

Experience with human exposure no data available

CMR effects

Carcinogenicity
Barium carbonate — No evidence of carcinogenicity in animal studies.

Mutagenicity
Barium carbonate — Tests on bacterial or mammalian cell cultures did not show mutagenic effects.

Aspiration toxicity no data available

SECTION 12: Ecological information

12.1 Toxicity

Aquatic Compartment

Acute toxicity to fish
Barium carbonate — By analogy

LC50 - 96 h : > 3.5 mg/l - Danio rerio (zebra fish)
static test
Analytical monitoring: yes

Method: OECD Test Guideline 201
Not harmful to fish (LC/LL50 > 100 mg/L)
Unpublished internal reports

Acute toxicity to daphnia and other aquatic invertebrates.

Barium carbonate	By analogy LC50 - 48 h : 14.5 mg/l - Daphnia magna (Water flea) static test Analytical monitoring: yes Method: OECD Test Guideline 202 Not harmful to aquatic invertebrates. (EC/EL50 > 100 mg/L) Published data

Toxicity to aquatic plants

Barium carbonate	By analogy ErC50 - 72 h : > 1.15 mg/l - Pseudokirchneriella subcapitata (green algae) static test Analytical monitoring: yes Method: OECD Test Guideline 201 Not harmful to algae (EC/EL50 > 100 mg/L) Unpublished internal reports By analogy NOEC - 72 h : > 1.15 mg/l - Pseudokirchneriella subcapitata (green algae) static test Analytical monitoring: yes Method: OECD Test Guideline 201 Growth rate No adverse chronic effect observed up to and including the threshold of 1 mg / L. Unpublished internal reports

Toxicity to microorganisms

Barium carbonate	By analogy NOEC - 3 h : 622 mg/l - activated sludge static test Analytical monitoring: yes Method: OECD Test Guideline 209 Unpublished internal reports

Chronic toxicity to fish

Barium carbonate	By analogy NOEC: > 1.26 mg/l - 33 Days - Danio rerio (zebra fish) semi-static test Analytical monitoring: yes Method: OECD Test Guideline 210 Unpublished internal reports No adverse chronic effect observed up to and including the threshold of 1 mg / L.

Chronic toxicity to daphnia and other aquatic invertebrates.

Barium carbonate	By analogy

NOEC: 2.9 mg/l - 21 Days - Daphnia magna (Water flea)
semi-static test
Analytical monitoring: yes
Method: OECD Test Guideline 211
Published data
No adverse chronic effect observed up to and including the threshold of 1 mg / L.

Chronic Toxicity to aquatic plants no data available

12.2 Persistence and degradability

Abiotic degradation

Photodegradation
Barium carbonate — Water/soil
slow ionization and cation precipitation in presence of sulfates or carbonates

Physical- and photo-chemical elimination no data available

Biodegradation

Biodegradability
Barium carbonate — Not applicable

12.3 Bioaccumulative potential

Partition coefficient: n-octanol/water no data available

Bioconcentration factor (BCF)
Barium carbonate — potential accumulation of the cation

12.4 Mobility in soil

Adsorption potential (Koc) no data available

Known distribution to environmental compartments
Barium carbonate — Ultimate destination of the product: Water

Soil

12.5 Results of PBT and vPvB assessment

no data available

12.6 Other adverse effects

Ecotoxicity assessment

Acute aquatic toxicity

Barium carbonate	No toxicity at the limit of solubility.

Chronic aquatic toxicity

Barium carbonate	No adverse chronic effect observed up to and including the threshold of 1 mg / L.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product Disposal

- In accordance with local and national regulations.
- Use a solution of sodium or magnesium sulfate or possibly a dilute solution of sulfuric acid to form a sulfate precipitate.
- Dispose of wastes in an approved waste disposal facility.

Waste Code

- Environmental Protection Agency
- Hazardous Waste – YES

- RCRA Hazardous Waste (40 CFR 302)
- D005 - Barium

Advice on cleaning and disposal of packaging

- 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.

SECTION 14: Transport information

DOT
not regulated

TDG
not regulated

NOM
not regulated

IMDG
not regulated

IATA
not regulated

Note: The above regulatory prescriptions are those valid on the date of publication of this sheet. Given the possible evolution of transportation regulations for hazardous materials, it would be advisable to check their validity with your sales office.

SECTION 15: Regulatory information

15.1 Notification status

Inventory Information	Status
United States TSCA Inventory	- Not On TSCA Inventory
Mexico INSQ (INSQ)	- In compliance with the inventory
Canadian Domestic Substances List (DSL)	- One or more components not listed on inventory
New Zealand. Inventory of Chemical Substances	- In compliance with the inventory
Australia Inventory of Chemical Substances (AICS)	- One or more components not listed on inventory
Japan. CSCL - Inventory of Existing and New Chemical Substances	- Not in compliance with the inventory
Korea. Korean Existing Chemicals Inventory (KECI)	- One or more components not listed on inventory
China. Inventory of Existing Chemical Substances in China (IECSC)	- One or more components not listed on inventory
Philippines Inventory of Chemicals and Chemical Substances (PICCS)	- One or more components not listed on inventory
EU. European Registration, Evaluation, Authorisation and Restriction of Chemical (REACH)	- When purchased from a European Solvay legal entity, this product is compliant with the registration provisions of the REACH Regulation (EC) No. 1907/2006 as all its components are either excluded, exempt, pre-registered and/or registered. When purchased from a legal entity outside of Europe, please contact your local representative for additional information.

15.2 Federal Regulations

US. EPA EPCRA SARA Title III

SARA HAZARD DESIGNATION SECTIONS 311/312 (40 CFR 370)

Acute toxicity (any route of exposure)	Yes

The categories not mentioned are not relevant for the product.

Section 313 Toxic Chemicals (40 CFR 372.65)

The following components are subject to reporting levels established by SARA Title III, Section 313:

Ingredients	CAS-No.	Concentration
Barium carbonate	513-77-9	90- 100%

Section 302 Emergency Planning Extremely Hazardous Substance Threshold Planning Quantity (40 CFR 355)
This material does not contain any components with a section 302 EHS TPQ.

Section 302 Emergency Planning Extremely Hazardous Substance Reportable Quantity (40 CFR 355)
This material does not contain any components with a SARA 302 RQ.

Section 304 Emergency Release Notification Reportable Quantity (40 CFR 355)
This material does not contain any components with a section 304 EHS RQ.

US. EPA CERCLA Hazardous Substances and Reportable Quantities (40 CFR 302.4)

This material does not contain any components with a CERCLA RQ.

15.3 State Regulations

US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

SECTION 16: Other information

Further information

- Product evaluated under the US GHS format.

- This sheet was updated (refer to the date at the top of this page). Subheadings and text which have been modified since the previous version are indicated with two vertical bars.
- Distribute new edition to clients

Date Prepared: 12/19/2017

Key or legend to abbreviations and acronyms used in the safety data sheet

- TWA	8-hour, time-weighted average
- ACGIH	American Conference of Governmental Industrial Hygienists
- OSHA	Occupational Safety and Health Administration
- NTP	National Toxicology Program
- IARC	International Agency for Research on Cancer
- NIOSH	National Institute for Occupational Safety and Health