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

1.1 Product identifier
- Trade name: BARIUM SULFATE PRECIPITATED - BLANC FIXE MICRONIZED JM3B
- Chemical name: Barium sulfate
- Molecular formula: BaSO4

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

Uses of the Substance / Mixture
- Manufacture of pigments
- Manufacture of plastics products
- Manufacture of paper
- Manufacture of batteries and accumulators
- Industrial manufacture of coatings and inks
- Manufacture of paints and coatings
- Industrial and professional use of paints and coatings

Uses advised against
- none

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: +1-800-7658292; +1-713-5256700
Fax: +1-713-5257805

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)
- Not a hazardous product according to the OSHA Globally Harmonized System (GHS)

2.2 Label elements

HCS 2012 (29 CFR 1910.1200)
- Not a hazardous product according to the OSHA Globally Harmonized System (GHS)
2.3 Other hazards which do not result in classification
- Product dust may be irritating to eyes, skin and respiratory system.
- Possible risk of irreversible effects through inhalation.
- Risk of pulmonary overload (respirable particulates)

SECTION 3: Composition/information on ingredients

3.1 Substance

Hazardous Ingredients and Impurities

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Identification number CAS-No.</th>
<th>Concentration [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric acid, barium salt (1:1)</td>
<td>7727-43-7</td>
<td>&gt;= 95 - &lt; 99</td>
</tr>
</tbody>
</table>

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

3.2 Mixture

Not applicable, this product is a substance.

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
- Wash off with soap and water.

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
- Rinse mouth with water.
- Do NOT induce vomiting.
- If symptoms persist, call a physician or Poison Control Center immediately.

4.2 Most important symptoms and effects, both acute and delayed

In case of inhalation
Effects
- May cause nose, throat, and lung irritation.
  Repeated or prolonged exposure
- Risk of pulmonary overload (respirable particulates)

In case of skin contact
Effects
- No known effect.
- See Toxicological Information Section 11.

In case of eye contact
Effects
- Contact with eyes may cause irritation.
In case of ingestion

Effects
- Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician
- If accidentally swallowed obtain immediate medical attention.
- When symptoms persist or in all cases of doubt seek medical advice.

SECTION 5: Firefighting measures

Flash point
Not applicable

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 known.

5.2 Special hazards arising from the substance or mixture

Specific hazards during fire fighting
- Not combustible.

Hazardous combustion products:
- Barium oxide
- Sulfur oxides

5.3 Advice for firefighters

Special protective equipment for fire-fighters
- In the event of fire, wear self-contained breathing apparatus.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel
- Evacuate personnel to safe areas.
- Avoid dust formation.

Advice for emergency responders
- Use personal protective equipment.
- Sweep up to prevent slipping hazard.
- 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
- Sweep up and shovel into suitable 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
- Ensure adequate ventilation.

Hygiene measures
- 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.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/Storage conditions
- Store in original container.
- Store in a well-ventilated place.
- Keep in a dry place.
- Keep container closed.

Packaging material

Suitable material
- Paper.
- Polyethylene

Unsuitable material
- No data available

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

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Value type</th>
<th>Value</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfuric acid, barium salt (1:1)</td>
<td>TWA</td>
<td>5 mg/m3</td>
<td>American Conference of Governmental Industrial Hygienists</td>
</tr>
</tbody>
</table>
8.2 Exposure controls

**Control measures**

**Engineering measures**
- Provide appropriate exhaust ventilation at places where dust is formed.
- Apply technical measures to comply with the occupational exposure limits.

**Individual protection measures**

**Respiratory protection**
- Use only respiratory protection that conforms to international/ national standards.
- Use NIOSH approved respiratory protection.
- Respirator with a particle filter (EN 143)

**Hand protection**
- Wear suitable gloves.

**Suitable material**
- PVC
- Natural Rubber

**Eye protection**
- Dust proof goggles, if dusty.

**Skin and body protection**
- Dust impervious protective suit

**Hygiene measures**
- 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.
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

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
<td></td>
</tr>
<tr>
<td>Form:</td>
<td>Crystalline powder</td>
</tr>
<tr>
<td>Physical state:</td>
<td>solid</td>
</tr>
<tr>
<td>Color:</td>
<td>white</td>
</tr>
<tr>
<td>Particle size:</td>
<td>ca. 0.6 - 1 µm</td>
</tr>
<tr>
<td>Mean diameter</td>
<td></td>
</tr>
<tr>
<td><strong>Odor</strong></td>
<td>odorless</td>
</tr>
<tr>
<td><strong>Odor Threshold</strong></td>
<td>no data available</td>
</tr>
<tr>
<td><strong>Molecular weight</strong></td>
<td>233.39 g/mol</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>ca. 9.0</td>
</tr>
<tr>
<td><strong>pKa:</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Melting point/freezing point</strong></td>
<td>Decomposition: yes</td>
</tr>
<tr>
<td></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Initial boiling point and boiling range</strong></td>
<td>Boiling point/boiling range: ()</td>
</tr>
<tr>
<td></td>
<td>Thermal decomposition: yes</td>
</tr>
<tr>
<td></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Flash point</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Evaporation rate (Butylacetate = 1)</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Flammability (solid, gas)</strong></td>
<td>The product is not flammable.</td>
</tr>
<tr>
<td><strong>Flammability / Explosive limit</strong></td>
<td>Explosiveness:</td>
</tr>
<tr>
<td></td>
<td>Not explosive</td>
</tr>
<tr>
<td><strong>Autoignition temperature</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Vapor pressure</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Vapor density</strong></td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Density</strong></td>
<td></td>
</tr>
<tr>
<td>Relative density</td>
<td>4.5</td>
</tr>
<tr>
<td><strong>Solubility</strong></td>
<td></td>
</tr>
<tr>
<td>Water solubility:</td>
<td>3.1 mg/l (77 °F (25 °C))</td>
</tr>
<tr>
<td></td>
<td>insoluble</td>
</tr>
<tr>
<td><strong>Partition coefficient: n-octanol/water</strong></td>
<td>Not applicable</td>
</tr>
</tbody>
</table>
Decomposition temperature  
> 2,912 °F (> 1,600 °C)

Viscosity  
Viscosity, dynamic: Not applicable

**Explosive properties**

no data available

**Oxidizing properties**

Not considered as oxidizing.

9.2 Other information  
no data available

### SECTION 10: Stability and reactivity

**10.1 Reactivity**
- According to experience not expected

**10.2 Chemical stability**
- Stable under recommended storage conditions.

**10.3 Possibility of hazardous reactions**
- According to experience not expected

**10.4 Conditions to avoid**
- To avoid thermal decomposition, do not overheat.

**10.5 Incompatible materials**
- none

**10.6 Hazardous decomposition products**
- Barium oxide
- Sulfur oxides

### SECTION 11: Toxicological information

**11.1 Information on toxicological effects**

**Acute toxicity**

**Acute oral toxicity**
LD50: > 5,000 mg/kg - Rat

**Acute inhalation toxicity**
no data available

**Acute dermal toxicity**
By analogy
LD50 Dermal: > 2,000 mg/kg - Rat
Not classified as harmful by contact with skin
Published data

**Acute toxicity (other routes of administration)**
no data available
Skin corrosion/irritation

By analogy

No skin irritation
in vitro test
Unpublished reports

Serious eye damage/eye irritation

Rabbit
No eye irritation

Respiratory or skin sensitization

By analogy

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

Mutagenicity

Genotoxicity in vitro

By analogy

In vitro tests did not show mutagenic effects

Genotoxicity in vivo
no data available

Carcinogenicity

By analogy

Rat
Mouse

Oral
Exposure duration: 2 y
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
ACGIH

Toxicity for reproduction and development

Toxicity to reproduction / fertility
no data available

Developmental Toxicity/Teratogenicity
no data available
STOT
STOT-single exposure
The substance or mixture is not classified as specific target organ toxicant, single exposure according to GHS criteria.

STOT-repeated exposure
The substance or mixture is not classified as specific target organ toxicant, repeated exposure according to GHS criteria.
Oral exposure 90-day - Rat , for males and females
NOAEL: > 104 mg/kg
Target Organs: Cardio-vascular system, hematology system, Adrenal gland drinking water
Published data

Aspiration toxicity
no data available

Further information
Health injuries are not known or expected under normal use.
No data exists on the effects of nanometer sized particles on the body.
Other dangerous properties cannot be excluded.
SECTION 12: Ecological information

12.1 Toxicity

Aquatic Compartment

**Acute toxicity to fish**

The product is biologically inert.

**Acute toxicity to daphnia and other aquatic invertebrates.**

- **EC50 - 48 h**: 14.5 mg/l - *Daphnia magna* (Water flea)
  - static test
  - Analytical monitoring: yes
  - Test substance: Barium chloride dihydrate
  - Method: OECD Test Guideline 202
  - Published data

Toxicity to aquatic plants

- **ErC50 - 72 h**: > 1.15 mg/l - *Pseudokirchneriella subcapitata* (microalgae)
  - static test
  - Analytical monitoring: yes
  - Test substance: Barium chloride dihydrate
  - Method: OECD Test Guideline 201
  - Unpublished internal reports

- **NOEC - 72 h**: > 1.15 mg/l - *Pseudokirchneriella subcapitata* (microalgae)
  - static test
  - Analytical monitoring: yes
  - Endpoint: Growth rate
  - Test substance: Barium chloride dihydrate
  - Method: OECD Test Guideline 201
  - Unpublished internal reports

Toxicity to microorganisms

- **NOEC - 3 h**: 622 mg/l - activated sludge
  - Respiration inhibition
  - Analytical monitoring: yes
  - Test substance: Barium chloride dihydrate
  - Method: OECD Test Guideline 209
  - Unpublished internal reports

Chronic toxicity to fish

- **NOEC**: > 1.26 mg/l - 33 d - *Danio rerio* (zebra fish)
  - semi-static test
  - Analytical monitoring: yes
  - Test substance: Barium chloride dihydrate
  - Method: OECD Test Guideline 210
  - Unpublished internal reports

Chronic toxicity to daphnia and other aquatic invertebrates.

- **NOEC**: 2.9 mg/l - 21 Days - *Daphnia magna* (Water flea)
  - semi-static test
  - Analytical monitoring: yes
  - Test substance: Barium chloride dihydrate
  - Method: OECD Test Guideline 211
  - Published data
Chronic Toxicity to aquatic plants

no data available

Terrestrial Compartment

Toxicity to soil dwelling organisms

By analogy

NOEC: 258 mg/kg - 21 Days - Eisenia fetida (earthworms)
Reproduction Test
Test substance: Barium
Published data

By analogy

NOEC: 211 mg/kg - 28 Days - Folsomia candida
Reproduction Test
Test substance: Barium
Published data

12.2 Persistence and degradability

Abiotic degradation

Photodegradation
inert product in normal environmental conditions
Medium
Water
Soil

Physical- and photo-chemical elimination

no data available

Biodegradation

Biodegradability
The methods for determining biodegradability are not applicable to inorganic substances.

12.3 Bioaccumulative potential

Partition coefficient: n-octanol/water
Bioconcentration factor (BCF)
no data available
Bioaccumulation is unlikely.

12.4 Mobility in soil

Adsorption potential (Koc)
Water/soil
low solubility and mobility
potential adsorption
Air
mobility as solid aerosols

Known distribution to environmental compartments
no data available
12.5 Results of PBT and vPvB assessment Not applicable

12.6 Other adverse effects no data available

Ecotoxicity assessment

Acute aquatic toxicity No toxicity at the limit of solubility.

Chronic aquatic toxicity No adverse chronic effect observed up to and including the threshold of 1 mg / L.

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

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product Disposal
- In accordance with local and national regulations.
- Dispose of wastes in an approved waste disposal facility.

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

<table>
<thead>
<tr>
<th>Inventory Information</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States TSCA Inventory</td>
<td>Listed on Inventory</td>
</tr>
<tr>
<td>Mexico INSQ (INSQ)</td>
<td>In compliance with the inventory</td>
</tr>
<tr>
<td>Canadian Domestic Substances List (DSL)</td>
<td>Listed on Inventory</td>
</tr>
<tr>
<td>New Zealand. Inventory of Chemical Substances</td>
<td>In compliance with the inventory</td>
</tr>
<tr>
<td>Australia Inventory of Chemical Substances (AICS)</td>
<td>Listed on Inventory</td>
</tr>
<tr>
<td>Japan. CSCL - Inventory of Existing and New Chemical Substances</td>
<td>Listed on Inventory</td>
</tr>
<tr>
<td>Korea. Korean Existing Chemicals Inventory (KECI)</td>
<td>Listed on Inventory</td>
</tr>
<tr>
<td>China. Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>Listed on Inventory</td>
</tr>
<tr>
<td>Philippines Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>Listed on Inventory</td>
</tr>
<tr>
<td>EU. European Registration, Evaluation, Authorisation and Restriction of Chemical (REACH)</td>
<td>If product is purchased from Solvay in Europe it is in compliance with REACH, if not please contact the supplier.</td>
</tr>
</tbody>
</table>

15.2 Federal Regulations

US. EPA EPCRA SARA Title III

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

<table>
<thead>
<tr>
<th>SARA Section</th>
<th>Hazard</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>311/312</td>
<td>Fire Hazard</td>
<td>no</td>
</tr>
<tr>
<td></td>
<td>Reactivity</td>
<td>no</td>
</tr>
<tr>
<td></td>
<td>Sudden</td>
<td>no</td>
</tr>
<tr>
<td></td>
<td>Health</td>
<td>no</td>
</tr>
<tr>
<td></td>
<td>Chronic</td>
<td>no</td>
</tr>
</tbody>
</table>

Section 313 Toxic Chemicals (40 CFR 372.65)
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Section 302 Emergency Planning Extremely Hazardous Substance Threshold Planning Quantity (40 CFR 355)
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

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

NFPA (National Fire Protection Association) - Classification

<table>
<thead>
<tr>
<th>Category</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>1 slight</td>
</tr>
<tr>
<td>Flammability</td>
<td>0 minimal</td>
</tr>
<tr>
<td>Instability or Reactivity</td>
<td>1 slight</td>
</tr>
<tr>
<td>Special Notices</td>
<td>None</td>
</tr>
</tbody>
</table>

HMIS (Hazardous Materials Identification System (Paint & Coating)) - Classification

<table>
<thead>
<tr>
<th>Category</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>1 slight</td>
</tr>
<tr>
<td>Flammability</td>
<td>0 minimal</td>
</tr>
<tr>
<td>Reactivity</td>
<td>1 slight</td>
</tr>
<tr>
<td>PPE</td>
<td>Determined by User; dependent on local conditions</td>
</tr>
</tbody>
</table>

Further information

- Product evaluated under the US GHS format.

Date Prepared: 04/08/2016

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

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information, and belief at the date of its publication. Such information is only given as a guidance to help the user handle, use, process, store, transport, dispose, and release the product in satisfactory safety conditions and is not to be considered as a warranty or quality specification. It should be used in conjunction with technical sheets but do not replace them. Thus, the information only relates to the designated specific product and may not be applicable if such product is used in combination with other materials or in any other manufacturing process, unless otherwise specifically indicated. It does not release the user from ensuring he is in conformity with all regulations linked to its activity.