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

1.1 Product identifier
- Trade name: NOCOLOK® Li FLUX
- Chemical name: Aluminium potassium fluoride and Trilithium hexafluoroaluminate
- Molecular formula: K(x)Al(y)F(z) and Li3AlF6

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

Uses of the Substance / Mixture
- Welding and soldering agents
- Abrasive
- Domestic use

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; 24 HR CONTACT NUMBER: 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
- Acute toxicity, Category 4
- Eye irritation, Category 2A
- Effects on or via lactation
- Specific target organ systemic toxicity - repeated exposure, Category 1

H302: Harmful if swallowed.
H332: Harmful if inhaled.
H319: Causes serious eye irritation.
H362: May cause harm to breast-fed children.
H372: Causes damage to organs through prolonged or repeated exposure if inhaled. (Respiratory Tract), Inhalation
2.2 Label elements

**HCS 2012 (29 CFR 1910.1200)**

### Pictogram

- **Signal Word**
  - Danger

### Hazard Statements

- **H302 + H332** Harmful if swallowed or if inhaled.
- **H319** Causes serious eye irritation.
- **H362** May cause harm to breast-fed children.
- **H372** Causes damage to organs (Respiratory Tract) through prolonged or repeated exposure if inhaled.

### Precautionary Statements

**Prevention**

- **P201** Obtain special instructions before use.
- **P260** Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
- **P263** Avoid contact during pregnancy/ while nursing.
- **P264** Wash skin thoroughly after handling.
- **P270** Do not eat, drink or smoke when using this product.
- **P271** Use only outdoors or in a well-ventilated area.
- **P280** Wear eye protection/ face protection.

**Response**

- **P301 + P312 + P330** IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
- **P304 + P340 + P312** IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
- **P305 + P351 + P338** IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- **P308 + P313** IF exposed or concerned: Get medical advice/ attention.
- **P337 + P313** If eye irritation persists: Get medical advice/ attention.

### 2.3 Other hazards which do not result in classification

- **H402**: Harmful to aquatic life.
- **H412**: Harmful to aquatic life with long lasting effects.

---

**SECTION 3: Composition/information on ingredients**

### 3.1 Substance

- Not applicable, this product is a mixture.

### 3.2 Mixture

- **Formula**
  
  \[ K(x)Al(y)F(z) \text{ and } Li3AlF6 \]
Hazardous Ingredients and Impurities

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Identification number</th>
<th>Concentration [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum potassium fluoride</td>
<td>60304-36-1</td>
<td>&gt;= 90</td>
</tr>
<tr>
<td>Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11)-</td>
<td>13821-20-0</td>
<td>&lt; 10</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Identification number</th>
<th>Concentration [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum potassium fluoride</td>
<td>60304-36-1</td>
<td>&gt;= 90 - &lt; 95</td>
</tr>
<tr>
<td>Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11)-</td>
<td>13821-20-0</td>
<td>&gt;= 10 - &lt; 15</td>
</tr>
</tbody>
</table>

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

SECTION 4: First aid measures

4.1 Description of first-aid measures

In case of inhalation
- Move to fresh air.
- Oxygen or artificial respiration if needed.
- Get medical attention immediately if symptoms occur.

In case of skin contact
- Take off contaminated clothing and wash before reuse.
- Wash off with plenty of water.
- If symptoms persist, call a physician.

In case of eye contact
- Immediate medical attention is required.
- Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

In case of ingestion
- Immediate medical attention is required.
- If swallowed, rinse mouth with water (only if the person is conscious).
- Give to drink a 1% aqueous calcium gluconate solution.
- Do NOT induce vomiting.
- Artificial respiration and/or oxygen may be necessary.

4.2 Most important symptoms and effects, both acute and delayed

In case of inhalation

Symptoms
- Cough
- sore throat
- Nose bleeding
- At high concentrations:
- Chemical pneumonitis

Effects
- Irritating to mucous membranes

Repeated or prolonged exposure
- Risk of chronic bronchitis
- Risk of chronic pulmonary inflammation
In case of skin contact

Effects
- slight irritation
- Repeated exposure may cause skin dryness or cracking.
- Chronic exposure may cause dermatitis.

In case of eye contact

Symptoms
- Redness
- Lachrymation
- Swelling of tissue
- Burn

Effects
- Causes eye 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
- Immediate medical attention is required.
- Medical examination necessary even only on suspicion of intoxication.

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 decomposition products formed under fire conditions.

Hazardous combustion products:
- Hydrogen fluoride

5.3 Advice for firefighters
**SECTION 6: Accidental release measures**

6.1 Personal precautions, protective equipment and emergency procedures

**Advice for non-emergency personnel**
- Avoid dust formation.

**Advice for emergency responders**
- Keep area clean at all times with wet rag or mop - NEVER sweep!

6.2 Environmental precautions
- Discharge into the environment must be avoided.
- If the product contaminates rivers and lakes or drains inform respective authorities.
- Prevent product from entering sewage system.

6.3 Methods and materials for containment and cleaning up
- Avoid dust formation.
- Keep area clean at all times with wet rag or mop - NEVER sweep!
- Keep in 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
- Used in closed system
- Use only in well-ventilated areas.
- Keep away from heat and sources of ignition.
- Keep away from incompatible products
- Avoid inhalation, ingestion and contact with skin and eyes.

**Hygiene measures**
- Eye wash bottles or eye wash stations in compliance with applicable standards.
- When using do not eat, drink or smoke.
- 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.
- 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

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>Aluminum potassium fluoride</td>
<td>TWA</td>
<td>2.5 mg/m³</td>
<td>Occupational Safety and Health Administration</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Table Z-1 Limits for Air Contaminants</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CAS number varies with compound Expressed as :Fluorine</td>
</tr>
<tr>
<td>Aluminum potassium fluoride</td>
<td>TWA</td>
<td>2.5 mg/m³</td>
<td>American Conference of Governmental Industrial Hygienists</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Expressed as :Fluorine</td>
</tr>
<tr>
<td>Aluminum potassium fluoride</td>
<td>TWA</td>
<td>0.14 mg/m³</td>
<td>Solvay Acceptable Exposure Limit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Form of exposure : Respirable</td>
</tr>
<tr>
<td>Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11)-</td>
<td>TWA</td>
<td>0.1 mg/m³</td>
<td>Solvay Acceptable Exposure Limit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Form of exposure : Respirable</td>
</tr>
</tbody>
</table>
NIOSH IDLH (Immediately Dangerous to Life or Health Concentrations)

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>CAS-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum potassium fluoride</td>
<td>60304-36-1</td>
<td>250 mg/m³</td>
</tr>
<tr>
<td>Aluminum potassium fluoride</td>
<td>60304-36-1</td>
<td>250 mg/m³</td>
</tr>
</tbody>
</table>

Biological Exposure Indices

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Value type</th>
<th>Value</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum potassium fluoride</td>
<td>BEI</td>
<td>2 mg/l Fluoride Urine Prior to shift (16 hours after exposure ceases)</td>
<td>American Conference of Governmental Industrial Hygienists</td>
</tr>
<tr>
<td>Aluminum potassium fluoride</td>
<td>BEI</td>
<td>3 mg/l Fluoride Urine End of shift (As soon as possible after exposure ceases)</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
- Respirator with a dust filter
- Recommended Filter type: P3 filter
- Self-contained breathing apparatus in confined spaces/insufficient oxygen/in case of large uncontrolled emissions/in all circumstances when the mask and cartridge do not give adequate protection.
- Use only respiratory protection that conforms to international/national standards.
- Use NIOSH approved respiratory protection.
- Respirator with a dust filter

Hand protection
- Impervious gloves

Suitable material
- Neoprene
- Fluoroelastomer

Eye protection
- Dust proof goggles obligatory.

Skin and body protection
- Dust impervious protective suit

Hygiene measures
- Eye wash bottles or eye wash stations in compliance with applicable standards.
- When using do not eat, drink or smoke.
- 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>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>2 - 6 µm (50%)</td>
</tr>
<tr>
<td><strong>Odor</strong></td>
<td>odorless</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>no data available</td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>5.0 - 6.0 (10 g/l) (68 °F (20 °C))</td>
</tr>
<tr>
<td>Mixture</td>
<td></td>
</tr>
<tr>
<td><strong>Melting point/freezing point</strong></td>
<td>Melting point/range: 1056 - 1071 °F (569 - 577 °C)</td>
</tr>
<tr>
<td>Mixture</td>
<td></td>
</tr>
<tr>
<td><strong>Initial boiling point and boiling range</strong></td>
<td>Boiling point/boiling range: 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>no data available</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: 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>no data available</td>
</tr>
<tr>
<td><strong>Density</strong></td>
<td>2.8 - 3 g/cm3 (68 °F (20 °C))</td>
</tr>
<tr>
<td><strong>Bulk density</strong></td>
<td>300 - 550 kg/m3 (68 °F (20 °C))</td>
</tr>
<tr>
<td><strong>Relative density</strong></td>
<td>no data available</td>
</tr>
</tbody>
</table>
Solubility

Water solubility:
4.5 g/l (68 °F (20 °C))

Partition coefficient: n-octanol/water
Not applicable

Decomposition temperature
> 1292 °F (> 700 °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
- no data available

10.2 Chemical stability
- Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions
- no data available

10.4 Conditions to avoid
- none

10.5 Incompatible materials
- Strong acids and strong bases

10.6 Hazardous decomposition products
- Hydrogen fluoride

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Acute oral toxicity
Aluminum potassium fluoride
LD50: 2,150 mg/kg - Rat, female

The product has a low acute toxicity
LD50: 2,720 mg/kg - Rat, male
The product has a low acute toxicity

Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11)-
LD50: 300 - 2,000 mg/kg - Rat, female
Method: OECD Test Guideline 423
This product is classified as acute toxicity category 4
Unpublished internal reports

Aluminum potassium fluoride
LD50: 2,150 mg/kg - Rat, female
The product has a low acute toxicity

LD50: 2,720 mg/kg - Rat, male
The product has a low acute toxicity

Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11)-
LD50: 300 - 2,000 mg/kg - Rat, female
Method: OECD Test Guideline 423
This product is classified as acute toxicity category 4
Unpublished internal reports

Acute inhalation toxicity
Aluminum potassium fluoride
LC50 - 4 h (aerosol): 1 - 5 mg/l - Rat, male and female
This product is classified as acute toxicity category 4

Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11)-
LC50 - 4 h (aerosol): 0.5 - 1 mg/l - Rat, male and female
Method: OECD Test Guideline 403
This product is classified as acute toxicity category 3
Unpublished internal reports

Aluminum potassium fluoride
LC50 - 4 h (aerosol): 1 - 5 mg/l - Rat, male and female
This product is classified as acute toxicity category 4

Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11)-
LC50 - 4 h (aerosol): 0.5 - 1 mg/l - Rat, male and female
Method: OECD Test Guideline 403
This product is classified as acute toxicity category 3
Unpublished internal reports

Acute dermal toxicity
Aluminum potassium fluoride
LD50: > 2,000 mg/kg - Rabbit, male and female
Not classified as hazardous for acute dermal toxicity according to GHS.

Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11)-
LD50: > 2,000 mg/kg - Rat, male and female
Method: OECD Test Guideline 402
Not classified as hazardous for acute dermal toxicity according to GHS.
Unpublished internal reports

Aluminum potassium fluoride
LD50: > 2,000 mg/kg - Rabbit, male and female
Not classified as hazardous for acute dermal toxicity according to GHS.

Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11)-
LD50: > 2,000 mg/kg - Rat, male and female
Method: OECD Test Guideline 402
Not classified as hazardous for acute dermal toxicity according to GHS.
Unpublished internal reports

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

<table>
<thead>
<tr>
<th>Material</th>
<th>Test Method</th>
<th>Rabbit</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum potassium fluoride</td>
<td></td>
<td>No skin irritation</td>
<td></td>
</tr>
<tr>
<td>Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11)-</td>
<td>Method: OECD Test Guideline 404</td>
<td>No skin irritation</td>
<td>Unpublished internal reports</td>
</tr>
<tr>
<td>Aluminum potassium fluoride</td>
<td></td>
<td>No skin irritation</td>
<td></td>
</tr>
<tr>
<td>Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11)-</td>
<td>Method: OECD Test Guideline 404</td>
<td>No skin irritation</td>
<td>Unpublished internal reports</td>
</tr>
</tbody>
</table>

### Serious eye damage/eye irritation

<table>
<thead>
<tr>
<th>Material</th>
<th>Test Method</th>
<th>Rabbit</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum potassium fluoride</td>
<td>Method: OECD Test Guideline 405</td>
<td>Irritating to eyes.</td>
<td></td>
</tr>
<tr>
<td>Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11)-</td>
<td>Method: OECD Test Guideline 405</td>
<td>Not classified as irritating to eyes</td>
<td>Unpublished internal reports</td>
</tr>
<tr>
<td>Aluminum potassium fluoride</td>
<td>Method: OECD Test Guideline 405</td>
<td>Irritating to eyes.</td>
<td></td>
</tr>
<tr>
<td>Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11)-</td>
<td>Method: OECD Test Guideline 405</td>
<td>Not classified as irritating to eyes</td>
<td>Unpublished internal reports</td>
</tr>
<tr>
<td>Substance flexibility</td>
<td>Methodology</td>
<td>Result</td>
<td></td>
</tr>
<tr>
<td>-----------------------</td>
<td>------------------------------</td>
<td>------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Aluminum potassium fluoride</td>
<td>Maximization Test - Guinea pig</td>
<td>Does not cause skin sensitization. Method: OECD Test Guideline 406</td>
<td></td>
</tr>
<tr>
<td>Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11)-</td>
<td>Local lymph node assay - Mouse</td>
<td>Does not cause skin sensitization. Method: OECD Test Guideline 429 Unpublished internal reports</td>
<td></td>
</tr>
<tr>
<td>Aluminum potassium fluoride</td>
<td>Maximization Test - Guinea pig</td>
<td>Does not cause skin sensitization. Method: OECD Test Guideline 406</td>
<td></td>
</tr>
<tr>
<td>Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11)-</td>
<td>Local lymph node assay - Mouse</td>
<td>Does not cause skin sensitization. Method: OECD Test Guideline 429 Unpublished internal reports</td>
<td></td>
</tr>
</tbody>
</table>
Mutagenicity
Genotoxicity in vitro

Aluminum potassium fluoride

Ames test
with and without metabolic activation
negative
Method: OECD Test Guideline 471

In vitro micronucleus test
Strain: Human lymphocytes
with and without metabolic activation
positive
Method: OECD Test Guideline 487

Gene mutation assays in mammalian cells.
Strain: mouse lymphoma cells
with and without metabolic activation
negative
Method: OECD Test Guideline 476

Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11)-

Ames test
with and without metabolic activation
negative
Method: OECD Test Guideline 471
Unpublished internal reports

Chromosome aberration test in vitro
Strain: Human lymphocytes
without metabolic activation
positive
Method: OECD Test Guideline 473
Unpublished internal reports

Chromosome aberration test in vitro
Strain: Human lymphocytes
with metabolic activation
negative
Method: OECD Test Guideline 473
Unpublished internal reports

Aluminum potassium fluoride

Ames test
with and without metabolic activation
negative
Method: OECD Test Guideline 471

In vitro micronucleus test
Strain: Human lymphocytes
with and without metabolic activation
positive
Method: OECD Test Guideline 487
Gene mutation assays in mammalian cells.
Strain: mouse lymphoma cells
with and without metabolic activation

negative
Method: OECD Test Guideline 476

Aluminate(3-), hexafluoro-, lithium (1:3),
(OC-6-11)-
Ames test
with and without metabolic activation

negative
Method: OECD Test Guideline 471
Unpublished internal reports

Chromosome aberration test in vitro
Strain: Human lymphocytes
without metabolic activation

positive
Method: OECD Test Guideline 473
Unpublished internal reports

Chromosome aberration test in vitro
Strain: Human lymphocytes
with metabolic activation

negative
Method: OECD Test Guideline 473
Unpublished internal reports

**Genotoxicity in vivo**

Aluminum potassium fluoride

By analogy

Chromosome aberration test in vivo - Rat male
Inhalation
Method: OECD Test Guideline 475
Test substance: Cryolite

negative

Aluminate(3-), hexafluoro-, lithium (1:3),
(OC-6-11)-
In vivo micronucleus test - Mouse male and female
Oral
Method: OECD Test Guideline 474

negative
Unpublished internal reports

Aluminum potassium fluoride

By analogy

Chromosome aberration test in vivo - Rat male
Inhalation
Method: OECD Test Guideline 475
Test substance: Cryolite

negative
Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11)-

In vivo micronucleus test - Mouse
male and female
oral
Method: OECD Test Guideline 474

negative
Unpublished internal reports

Carcinogenicity

Aluminum potassium fluoride By analogy

Rat
Test substance: fluoride
Animal testing did not show any carcinogenic effects.

Aluminum potassium fluoride By analogy

Rat
Test substance: fluoride
Animal testing did not show any carcinogenic effects.

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

Aluminum potassium fluoride By analogy

Two-generation study - Rat, male and female
oral
Fertility NOAEL Parent: $\geq 128$ mg/kg
Test substance, Cryolite

Aluminum potassium fluoride By analogy

Two-generation study - Rat, male and female
oral
Fertility NOAEL Parent: $\geq 128$ mg/kg
Test substance, Cryolite

Developmental Toxicity/Teratogenicity no data available
<table>
<thead>
<tr>
<th>Routes of exposure</th>
<th>Target Organs</th>
<th>NOAEC</th>
<th>NOAEL</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation (aerosol)</td>
<td>Respiratory</td>
<td>1.21</td>
<td>1.01</td>
<td>OECD Test Guideline 413</td>
</tr>
<tr>
<td>90-day - Rat, male and</td>
<td>system, Lungs</td>
<td></td>
<td></td>
<td>Unpublished internal reports</td>
</tr>
<tr>
<td>female</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inhalation (aerosol)</td>
<td>Respiratory</td>
<td>1.21</td>
<td>1.01</td>
<td>OECD Test Guideline 413</td>
</tr>
<tr>
<td>28-day - Rat, male and</td>
<td>system, Lungs</td>
<td></td>
<td></td>
<td>Unpublished internal reports</td>
</tr>
<tr>
<td>female</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Experience with human exposure**

no data available

**Aspiration toxicity**

no data available
12.1 Toxicity

**Aquatic Compartment**

**Acute toxicity to fish**

- **Aluminum potassium fluoride**
  - LC₅₀ - 96 h: > 10 mg/l - Brachydanio rerio (zebrafish)
  - Static test
  - Analytical monitoring: yes
  - Method: OECD Test Guideline 203
  - Harmful to fish.

- **Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11)-**
  - LC₅₀ - 96 h: > 100 mg/l - Gobiocypris rarus (rare gudgeon)
  - Semi-static test
  - Analytical monitoring: yes
  - Method: OECD Test Guideline 203
  - Unpublished internal reports
  - Not harmful to fish (LC/LL50 > 100 mg/L)

- **Aluminum potassium fluoride**
  - LC₅₀ - 96 h: > 10 mg/l - Brachydanio rerio (zebrafish)
  - Static test
  - Analytical monitoring: yes
  - Method: OECD Test Guideline 203
  - Harmful to fish.

- **Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11)-**
  - LC₅₀ - 96 h: > 100 mg/l - Gobiocypris rarus (rare gudgeon)
  - Semi-static test
  - Analytical monitoring: yes
  - Method: OECD Test Guideline 203
  - Unpublished internal reports
  - Not harmful to fish (LC/LL50 > 100 mg/L)
Acute toxicity to daphnia and other aquatic invertebrates.

**Aluminum potassium fluoride**
EC50 - 48 h : 22.8 mg/l - Daphnia magna (Water flea)
static test
Analytical monitoring: yes
Method: OECD Test Guideline 202
Harmful to aquatic invertebrates.

**Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11)**
EC50 - 48 h : 18.2 mg/l - Daphnia magna (Water flea)
static test
Analytical monitoring: yes
Method: OECD Test Guideline 202
Unpublished internal reports
Harmful to aquatic invertebrates.

**Aluminum potassium fluoride**
EC50 - 48 h : 22.8 mg/l - Daphnia magna (Water flea)
static test
Analytical monitoring: yes
Method: OECD Test Guideline 202
Harmful to aquatic invertebrates.

Toxicity to aquatic plants

**Aluminum potassium fluoride**
ErC50 - 72 h : 33.5 mg/l - Pseudokirchneriella subcapitata (green algae)
static test
Analytical monitoring: yes
Method: OECD Test Guideline 201
Harmful to algae.

NOEC - 72 h : 11.2 mg/l - Pseudokirchneriella subcapitata (green algae)
static test
Analytical monitoring: yes
Method: OECD Test Guideline 201
Growth rate

**Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11)**
ErC50 - 72 h : 16.1 mg/l - Pseudokirchneriella subcapitata (green algae)
static test
Analytical monitoring: yes
Method: OECD Test Guideline 201
Unpublished internal reports
Harmful to algae.

EC10 - 72 h : 7.57 mg/l - Pseudokirchneriella subcapitata (green algae)
static test
Analytical monitoring: yes
Method: OECD Test Guideline 201
Unpublished internal reports
No adverse chronic effect observed up to and including the threshold of 1 mg / L.

**Aluminum potassium fluoride**
ErC50 - 72 h : 33.5 mg/l - Pseudokirchneriella subcapitata (green algae)
static test
Analytical monitoring: yes
Method: OECD Test Guideline 201
Harmful to algae.

NOEC - 72 h : 11.2 mg/l - Pseudokirchneriella subcapitata (green algae)
static test
Analytical monitoring: yes
Method: OECD Test Guideline 201
Growth rate

Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11)-
ErC50 - 72 h : 16.1 mg/l - Pseudokirchneriella subcapitata (green algae)
static test
Analytical monitoring: yes
Method: OECD Test Guideline 201
Unpublished internal reports
Harmful to algae.

EC10 - 72 h : 7.57 mg/l - Pseudokirchneriella subcapitata (green algae)
static test
Analytical monitoring: yes
Method: OECD Test Guideline 201
Unpublished internal reports
No adverse chronic effect observed up to and including the threshold of 1 mg / L.

Toxicity to microorganisms
Aluminum potassium fluoride
EC50 - 3 h : > 75 mg/l - activated sludge
static test
Analytical monitoring: no
Method: OECD Test Guideline 209

Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11)-
EC50 - 3 h : > 1,000 mg/l - activated sludge
static test
Analytical monitoring: no
Method: OECD Test Guideline 209
Unpublished internal reports

Aluminum potassium fluoride
EC50 - 3 h : > 75 mg/l - activated sludge
static test
Analytical monitoring: no
Method: OECD Test Guideline 209

Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11)-
EC50 - 3 h : > 1,000 mg/l - activated sludge
static test
Analytical monitoring: no
Method: OECD Test Guideline 209
Unpublished internal reports

Chronic toxicity to fish
no data available

Chronic toxicity to daphnia and other aquatic invertebrates.
no data available

Chronic Toxicity to aquatic plants
no data available
12.2 Persistence and degradability

**Abiotic degradation**

**Stability in water**

- Aluminum potassium fluoride: acid/base equilibrium as a function of pH, complexation/precipitation of inorganic and organic materials. Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11). Product dissociates rapidly to corresponding ions on contact with water.

- Aluminum potassium fluoride: acid/base equilibrium as a function of pH, complexation/precipitation of inorganic and organic materials. Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11). Product dissociates rapidly to corresponding ions on contact with water.

**Physical- and photo-chemical elimination**

- No data available

**Biodegradation**

**Biodegradability**

- Aluminum potassium fluoride: The methods for determining the biological degradability are not applicable to inorganic substances.

- Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11): The methods for determining biodegradability are not applicable to inorganic substances.

- Aluminum potassium fluoride: The methods for determining the biological degradability are not applicable to inorganic substances.

- Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11): The methods for determining biodegradability are not applicable to inorganic substances.

12.3 Bioaccumulative potential

**Partition coefficient: n-octanol/water**

- No data available

**Bioconcentration factor (BCF)**

- Aluminum potassium fluoride: Not applicable, inorganic substance

- Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11): Not applicable

- Decomposes in contact with water.

- Aluminum potassium fluoride: Not applicable, inorganic substance

- Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11): Not applicable

- Decomposes in contact with water.
12.4 Mobility in soil

<table>
<thead>
<tr>
<th>Adsorption potential (Koc)</th>
<th>Adsorption/Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum potassium fluoride</td>
<td>Log Koc: 3.18</td>
</tr>
<tr>
<td></td>
<td>Air mobility as solid aerosols</td>
</tr>
<tr>
<td></td>
<td>Water low solubility and mobility</td>
</tr>
<tr>
<td></td>
<td>Soil/sediments adsorption on mineral and organic soil constituents</td>
</tr>
</tbody>
</table>

Aluminate(3-), hexafluoro-, lithium (1:3), (OC-6-11)-

<table>
<thead>
<tr>
<th>Adsorption/Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log Koc: 3.18</td>
</tr>
<tr>
<td>Air mobility as solid aerosols</td>
</tr>
<tr>
<td>Water low solubility and mobility</td>
</tr>
<tr>
<td>Soil/sediments adsorption on mineral and organic soil constituents</td>
</tr>
</tbody>
</table>

12.5 Results of PBT and vPvB assessment

Not applicable, inorganic substance

12.6 Other adverse effects

no data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product Disposal
- In accordance with local and national regulations.
- Refer to manufacturer/supplier for information on recovery/recycling.
- Dispose of wastes in an approved waste disposal facility.

Waste Code
- Environmental Protection Agency
- Hazardous Waste – NO
Advice on cleaning and disposal of packaging

- Where possible recycling is preferred to disposal or incineration.
- If recycling is not practicable, dispose of in compliance with local regulations.
- 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>In compliance with the inventory</td>
</tr>
<tr>
<td>New Zealand. Inventory of Chemical Substances</td>
<td>One or more components not listed on inventory</td>
</tr>
<tr>
<td>Canadian Domestic Substances List (DSL)</td>
<td>In compliance with the inventory</td>
</tr>
<tr>
<td>Australian Inventory of Chemical Substances (AICS)</td>
<td>One or more components not listed on inventory</td>
</tr>
<tr>
<td>Japan. CSCL - Inventory of Existing and New Chemical Substances</td>
<td>One or more components not listed on inventory</td>
</tr>
<tr>
<td>Korea. Korean Existing Chemicals Inventory (KECI)</td>
<td>In compliance with the inventory</td>
</tr>
<tr>
<td>China. Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>In compliance with the inventory</td>
</tr>
<tr>
<td>Philippines Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>One or more components not listed on inventory</td>
</tr>
<tr>
<td>European Inventory of Existing Commercial Chemical Substances (EINECS)</td>
<td>In compliance with the inventory</td>
</tr>
<tr>
<td>Canadian Non-Domestic Substances List (NDSL)</td>
<td>In compliance with the inventory</td>
</tr>
<tr>
<td></td>
<td>Except CAS: 13821-20-0</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>Property</th>
<th>Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity (any route of exposure)</td>
<td>Yes</td>
</tr>
<tr>
<td>Serious eye damage or eye irritation</td>
<td>Yes</td>
</tr>
<tr>
<td>Reproductive toxicity</td>
<td>Yes</td>
</tr>
<tr>
<td>Specific target organ toxicity (single or repeated exposure)</td>
<td>Yes</td>
</tr>
</tbody>
</table>

The categories not mentioned are not relevant for the product.

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)
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

**NFPA (National Fire Protection Association) - Classification**

<table>
<thead>
<tr>
<th>Category</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>2 moderate</td>
</tr>
<tr>
<td>Flammability</td>
<td>0 minimal</td>
</tr>
<tr>
<td>Instability or Reactivity</td>
<td>0 minimal</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>2 moderate</td>
</tr>
<tr>
<td>Flammability</td>
<td>0 minimal</td>
</tr>
<tr>
<td>Reactivity</td>
<td>0 minimal</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.
- 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:** 12/22/2017

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

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWA</td>
<td>8-hour, time-weighted average</td>
</tr>
<tr>
<td>SAEL</td>
<td>Solvay Acceptable Exposure Limit</td>
</tr>
<tr>
<td>ACGIH</td>
<td>American Conference of Governmental Industrial Hygienists</td>
</tr>
<tr>
<td>OSHA</td>
<td>Occupational Safety and Health Administration</td>
</tr>
<tr>
<td>NTP</td>
<td>National Toxicology Program</td>
</tr>
<tr>
<td>IARC</td>
<td>International Agency for Research on Cancer</td>
</tr>
<tr>
<td>NIOSH</td>
<td>National Institute for Occupational Safety and Health</td>
</tr>
</tbody>
</table>

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.