

United States Hazard Communication Standard 29 CFR 1910.1200 (2012)
Canada Hazardous Products Regulations (SOR/2015-17)
Regulation (EC) No 1907/2006 (REACH), Article 31
NORMA MEXICANA NOM-018-STPS-2015
Brazilian Standard ABNT NBR 14725-4: 2014

According to the standards and regulations noted above, a Safety Data Sheet (SDS) must be provided for hazardous substances or mixtures. This product does not meet the classification criteria of the standards/regulations noted. Therefore, this document is outside the scope of said standards/regulations; the requirements for content in each section do not apply.

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Product name:	Aluminum Fluoride
Synonym(s)	Aluminum Trifluoride (AlF ₃) Trifluoroaluminum
CAS number:	7784-18-1
EC number	232-051-1

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

Recommended use(s):	Aluminum smelting process Metal fluxing
Restrictions on use(s):	None Known

1.3 Details of the supplier of the safety data sheet

Suppliers:	Koura Global 950 Winter Street, South Entrance Waltham, MA 02451 USA	Koura Business Group Carr. Matamoros-Reynosa Km. 4.5 Ejido Las Rusias Matamoros, Tam. Mexico. C.P. 87560
Telephone:	+1 (508) 259-4483	+52 (868) 811-10-05 (Office) +52 (868) 811-10-45 (Plant)

1.4 Emergency telephone number

24-hour Emergency Telephone:	+1 (225) 642-6316 (USA) +52 (868) 811-10-05 (Mexico)
Alternative Emergency Telephone:	CHEMTREC: +1 (800) 424-9300 (USA) International CHEMTREC: +1 (703) 527-3887

2. HAZARDS IDENTIFICATION:

2.1 Classification of substance or mixture

Not classified as a hazardous substance. The product is not hazardous in the form in which it is placed on the market or under the normal and recommended conditions of use and storage.

2.2 Label Elements

Pictogram: None
Signal Word: None
Hazard statement(s): None
Precautionary Statement(s): None

2.3 Hazards not otherwise classified

Physical/Chemical Hazards

Releases hydrogen fluoride vapors if heated above 500°C in presence of water vapor.

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substance

Chemical names: Aluminum fluoride; Aluminum trifluoride; Trifluoroaluminum

Ingredient	C.A.S. Number	Percent (%) by Weight
Aluminum fluoride	7784-18-1	> 90

3.2 Mixture

This product is a substance

4. FIRST AID MEASURES

4.1. Description of first aid measures

General Advice:

Consult a physician. Show this safety data sheet to the doctor in attendance.

- Eye contact:** Immediately flush the eyes for at least 15 minutes with large amounts of gently flowing water. Hold the eyelids open and away from the eye during irrigation to allow thorough flushing of the eyes. If the person is wearing contact lenses, the lenses should be removed, if possible. However, flushing with water should not be interrupted, and the lenses should be removed by a person who is qualified to do so. In case of ongoing discomfort consult a physician
- Skin contact:** Immediately wash skin with soap and large amounts of cool water. Skin exposures can be treated with a 2.5% calcium gluconate gel repeated until burning ceases. Consult a physician.
- Inhalation:** Move person to fresh air. If breathing stops, provide artificial respiration. If effects occur, consult a physician and an authorized person should administer oxygen (12 l/min by mask) to a victim who is having difficulty breathing, until the victim is able to breathe easily by himself. Calcium gluconate, 2.5% in normal saline should be given by nebulizer with oxygen for a minimum of 15-20 minutes.
- Ingestion:** Never give anything by mouth to an unconscious person. Rinse mouth with water. Prevention of absorption of the fluoride ion in cases of ingestion can be obtained by giving milk, chewable calcium carbonate tablets or Milk of Magnesia to conscious person. Consult a physician.

4.2. Most important symptoms and effects, both acute and delayed

General information: Exposure to Hydrogen Fluoride (HF) requires immediate and specialized first aid and medical treatment. Symptoms may be delayed up to 24 hours depending on the concentration of HF. After decontamination with water, further damage can occur due to penetration/absorption of the fluoride ion. Treatment should be directed toward binding the fluoride ion. See Section 11 for additional information on health hazards.

4.3. Indication of any immediate medical attention and special treatment needed

If breathing is difficult, see Section 4.1 Inhalation. Hydrogen fluoride gas can be released if heated above 500°C in presence of water vapor

5. FIRE-FIGHTING MEASURES

5.1. Extinguishing media

- | | |
|--------------------------------|---------------------------------------|
| Suitable extinguishing media | Use regular dry chemical extinguisher |
| Unsuitable extinguishing media | Water must NOT be used |

5.2. Special hazards arising from the substance or mixture

Specific hazards	Hydrogen fluoride, Aluminum oxide
Hazardous combustion products	Inorganic; the product is not flammable. Toxic gases of hydrogen fluoride (HF) can develop in case of fire/heating over 500°C, and if water is added.

5.3. Advice for firefighters

Special protective equipment for fire-fighters	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Fire-fighting equipment should be thoroughly decontaminated after use
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6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions	Ensure adequate ventilation. Use personal protective equipment as required (See Section 8). Avoid dust formation. Avoid breathing dust
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6.2. Environmental precautions

Environmental precautions	Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. Prevent discharge into drains; do not flush into sanitary sewer system
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6.3. Methods and material for containment and cleaning up

Methods for cleaning up	Sweep up without generating dust and keep in appropriate containers. Collect spillage in suitable and tightly sealed containers
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7. HANDLING AND STORAGE

7.1. Precautions for safe handling

Advice on safe handling:	Wear appropriate personal protective equipment (refer to Section 8). Avoid/minimize the creation of dust. Avoid inhalation and ingestion. Ensure adequate ventilation. Avoid contact with eyes, skin and clothing.
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General hygiene considerations:

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas.

7.2. Conditions for safe storage, including any incompatibilities

Conditions for Safe Storage Store in accordance with local regulations. Store in a dry, well-ventilated place in tightly closed containers. Do not store in close proximity to acid.

8. EXPOSURE CONTROL/PERSONAL PROTECTION

8.1. Control parameters

Occupational exposure limits: No substance specific (inter)national regulations/recommendations identified. Exposure limits provided for similar substance(s), as noted.

The table below is a summary. Please see the specific legislation for complete information. Consult your local authorities for acceptable exposure recommendations/limits.

USA OSHA Permissible Exposure Level (PEL)	Note: This PEL applies to sodium fluoride and other inorganic, solid fluorides (as F). 2.5 mg/m ³ , TWA
USA ACGIH Threshold Limit Values (TLV)	2.5 mg/m ³ , TWA (Fluorides, as F)
USA NIOSH REL	Note: The REL applies to sodium fluoride and other inorganic, solid fluorides (as F). 2.5 mg/m ³ , TWA
Mexico	2.5 mg/m ³ , TWA (as F)
USA OSHA Permissible Exposure Level (PEL)	Note: This PEL applies to alumina, aluminum oxide 15 mg/m ³ (total), TWA 5 mg/m ³ (resp), TWA
Mexico	Note: This PEL applies to alumina, aluminum oxide 10 mg/m ³ (total), TWA

Biological occupational exposure limits

US ACGIH - Biological Exposure Indices (BEI)	Note: This BEI applies to fluorides. Basis - Bone damage Fluorosis Note 2: Prior to shift (16 hours after exposure ceases) 2 mg/l (in Urine)
	Note: This BEI applies to fluorides Note 2: End of shift (16 hours after exposure ceases) 3 mg/l (in Urine)

8.2. Exposure controls

Appropriate engineering controls	Handle in accordance with good industrial hygiene and safety practice. Ensure adequate ventilation. If this is not enough to keep dust concentrations in the air under exposure limits, suitable breathing apparatus must be used. Smoking prohibited.
Respiratory protection	Respiratory protection complying with an approved standard should be worn if a risk assessment indicates inhalation of contaminants is possible. Where protection from nuisance levels of dusts are desired, use type N95 (US) or type P1 (EN 143) dust masks. Use respirators and components tested and approved under appropriate government standards such as NIOSH (SU) or CEN (EU)
Hand protection	Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands after gloves are removed.
Eye	Wear chemical safety goggles. Use of contact lenses prohibited
Other skin and body protection	Wear appropriate clothing to prevent repeated or prolonged skin contact. Personal protective equipment for the body should be selected based on the task being performed

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Physical state and appearance	Solid / White powder
Odor	Odorless
Odor threshold	No data available
Specific gravity	
pH	~ 5.497 at 20° C
Melting point	1,291° C
Boiling point	ca. 1,537° C; non-volatile solid
Flash point	Not applicable; inorganic substance
Evaporation rate	Not applicable
Flammability (solid, gas)	Not applicable
Upper/lower flammability or explosive limits	Not applicable
Vapor pressure	Not applicable
Bulk Density	1.200 – 1.600 g/cm ³
Solubility in water	5.3 – 9.4 mg/l
Partition coefficient	No data available; inorganic substance
Auto-ignition temperature	Not applicable

Decomposition temperature	Not applicable
Viscosity	Not applicable
Explosive properties	Not explosive
Oxidizing properties	Not oxidizing

10. STABILITY AND REACTIVITY

10.1. Reactivity

Reactivity: Aluminum fluoride slowly dissolves in strong sulfuric acid with the release of hydrogen fluoride, and in strong alkaline water solutions, aluminate is formed. Aluminum fluoride is slowly decomposed by melted alkalis, with the formation of fluorides and aluminate

10.2. Chemical stability

Stability: Stable under the prescribed storage conditions. Avoid high temperatures (over 600°C in dry state and 300°C in moist condition)

10.3. Possibility of hazardous reactions

Possibility of hazardous reactions: None known

10.4. Conditions to avoid

Conditions to avoid: Avoid high temperatures, humidity, and heating above 500°C

10.5. Incompatible materials

Materials to avoid: Strong oxidizing agents. Acids. Water. Sodium/sodium oxides

10.6. Hazardous decomposition products

Hazardous decomposition products: When the product is heated, it decomposes and toxic gas of hydrogen fluoride can form, especially when water is present

11. TOXICOLOGICAL INFORMATION

11. Information on toxicological effects

Acute toxicity - oral	LDL ₀ > 2000 mg/kg body weight (rat) (OECD Test Guideline 420)
Acute toxicity - inhalation	LC50 > 0.530 mg/L in air, 4-hour (rat) (OECD Test Guideline 403)
Skin corrosion/irritation	Not a skin irritant, (rabbit) (OECD Test Guideline 404)
Serious eye damage/irritation	Not an eye irritant (rabbit) (OECD Test Guideline 405)
Skin sensitization	Non-sensitizing to skin (mouse) (OECD Test Guideline 429)
Germ cell mutagenicity	No data available

Genotoxicity – in vitro	
Reproductive toxicity *read-across substance trisodium hexafluoroaluminate (cryolite); study not conducted with aluminum fluoride	*Oral NOAEL of 100 mg/kg bw/day for developmental toxicity Oral NOAEL of 30 mg/kg bw/day for maternal toxicity (OECD Test Guideline 414 equivalent)
Specific target organ toxicity - single exposure STOT - single exposure	No data available
Specific target organ toxicity (STOT) - repeated exposure - inhalation	NOAEL - 7 mg/m ³ air (analytical), (rat) (OECD Test Guideline 412)
Aspiration hazard	No data available

Carcinogenicity

IARC: No component of this product, present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC

ACGIH: No component of this product, present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by ACGIH. See note below*

NTP: No component of this product, present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by NTP

OSHA: No component of this product, present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by OSHA

*Note: ACGIH Determination for Fluoride (as F) - A4, Not Classifiable as a Human Carcinogen

12. ECOLOGICAL INFORMATION

12.1. Toxicity

Toxicity to fish (zebra fish)	NOEC: 7.6 mg fluoride/L, 96 hr EC50: > 7.6 mg fluoride/L, 96 hr (OECD Test Guideline 203)
Toxicity to daphnia magna	NOEC: 7.6 mg fluoride/L, 48-hour EC50 > 7.6 mg fluoride/L, 48-hour (OECD Test Guideline 202)
Toxicity to algae (selenastrum capricornutum)	NOEC: 1.7 mg fluoride/L, 72-hour EC10: 1.8 mg fluoride/L, 72-hour EC50 & EC90: > 1.8 mg fluoride/L, 72-hour (OECD Guideline Study 201)

12.2. Persistence and degradability

Not applicable; inorganic substance

12.3. Bioaccumulative potential

Not applicable

12.4. Mobility in soil

Not applicable

12.5. Results of PBT and vPvB assessment

Does not fulfill the criteria for vPvB or PBT substance

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Product

Disposal Method:

The generation of waste should be avoided or minimized whenever possible. Disposal practices must be in compliance with all federal, state and local laws and regulations. DO NOT dump into any sewers, on the ground or into any body of water. Contact a licensed professional waste disposal service to ensure proper disposal.

Hazardous Waste:

- EPA Hazardous Waste Number (RCRA): Not determined
- EU Directive 2008/98/EC: Not defined as a hazardous waste

Packaging

Disposal Method:

The generation of waste should be avoided or minimized whenever possible. Empty containers or liners may retain some product residues. Contact a licensed professional waste disposal service for disposal guidance.

14. TRANSPORT INFORMATION

DOT (US): Not regulated

IMDG: Not regulated

IATA: Not regulated

ADR/RID: Not regulated

Packaging Method: Package to prevent water infiltration

Transportation considerations: Prevent water penetration/rainwater soaking

15. REGULATORY INFORMATION

International Inventories

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory	Complies; Listed as "Active"
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List	Complies
ENCS - Japan Existing and New Chemical Substances	Complies
ISHL – Japan Inventory of Chemical Substances	Not determined
IECSC - China Inventory of Existing Chemical Substances	Complies
KECI - Korean Existing and Evaluated Chemical Substances	Complies
PICCS - Philippines Inventory of Chemicals and Chemical Substances	Complies
AICS - Australian Inventory of Chemical Substances	Complies
NZIoC - New Zealand Inventory of Chemicals	Complies
TCSI – Taiwan Chemical Substance Inventory	Complies
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances	Complies

US Federal Regulations

SARA Section 302 (40 CFR 355) Extremely Hazardous Substances: No component(s) is listed as extremely hazardous substances under SARA Section 302

SARA 311/312 Hazard Categories: See GHS classification in section 2 for applicable SARA 311/312 hazard categories under the revised 40 CFR 370 (June 13, 2016)

SARA Section 313 (40 CFR 372) Toxics Release Inventory: Does not contain any of the substances identified under Section 313 as toxic chemicals in excess of the de minimis concentrations necessary to be subject to the supplier notification requirements.

US. State Regulations – Right to Know

California Proposition 65: This product does not contain any Proposition 65 chemical
 Massachusetts: No component(s) of the material is subject to Massachusetts Right to Know Act
 New Jersey: Aluminum fluoride, CAS No. 7784-18-1
 Pennsylvania: Aluminum fluoride, CAS No. 7784-18-1

16. OTHER INFORMATION

Glossary:

IARC: International Agency for Research on Cancer
ACGIH: American Conference of Governmental Industrial Hygienists
NTP: National Toxicology Program of the United States
NIOSH: National Institute for Occupational Safety and Health
OSHA: Occupational Safety and Health Administration
ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
RID: European Agreement concerning the International Carriage of Dangerous Goods by Rail
IATA: International Air Transport Association
ICAO: Technical Instructions for the Safe Transport of Dangerous Goods by Air
IMDG: International Maritime Dangerous Goods
CAS: Chemical Abstracts Service
LC₅₀: Lethal Concentration to 50 % of a test population
LD₅₀: Lethal Dose to 50% of a test population (Median Lethal Dose)
PBT: Persistent, Bioaccumulative and Toxic substance
vPvB: Very Persistent and Very Bioaccumulative

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END OF SAFETY DATA SHEET