

1 Identification

Product identifier

Product name: **Dihydrogen hexafluorozirconate, 45% in 2%hydrofluoric acid**

Stock number: 39737

CAS Number:
 12021-95-3

Relevant identified uses of the substance or mixture and uses advised against.
Identified use: SU24 Scientific research and development

Details of the supplier of the safety data sheet

Manufacturer/Supplier:

Alfa Aesar
 Thermo Fisher Scientific Chemicals, Inc.
 30 Bond Street
 Ward Hill, MA 01835-8099
 Tel: 800-343-0660
 Fax: 800-322-4757
 Email: tech@alfa.com
 www.alfa.com


Information Department: Health, Safety and Environmental Department

Emergency telephone number:

During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789.

2 Hazard(s) identification


Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)

 GHS06 Skull and crossbones

Acute Tox. 2 H300 Fatal if swallowed.

Acute Tox. 2 H310 Fatal in contact with skin.

Acute Tox. 2 H330 Fatal if inhaled.

 GHS05 Corrosion

Skin Corr. 1A H314 Causes severe skin burns and eye damage.

Eye Dam. 1 H318 Causes serious eye damage.

Hazards not otherwise classified No information known.

Label elements

GHS label elements The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)

Hazard pictograms



GHS05 GHS06

Signal word

Danger

Hazard statements

H300+H310+H330 Fatal if swallowed, in contact with skin or if inhaled.

H314 Causes severe skin burns and eye damage.

Precautionary statements

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor/...

P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P320 Specific treatment is urgent (see on this label).

P361 Take off immediately all contaminated clothing.

P405 Store locked up.

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

WHMIS classification

D1A - Very toxic material causing immediate and serious toxic effects

D2B - Toxic material causing other toxic effects

E - Corrosive material



Classification system

HMIS ratings (scale 0-4)

(Hazardous Materials Identification System)

HEALTH 3 Health (acute effects) = 3

FIRE 0 Flammability = 0

REACTIVITY 1 Physical Hazard = 1

Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

3 Composition/information on ingredients

Chemical characterization: Substances

CAS# Description:

12021-95-3 Dihydrogen hexafluorozirconate, 45% in 2%hydrofluoric acid

Additional information: Zirconium is routinely found with a low level of hafnium since separation of the two elements is difficult.

Product name: Dihydrogen hexafluorozirconate, 45% in 2%hydrofluoric acid

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4 First-aid measures

Description of first aid measures

General information

Immediately remove any clothing soiled by the product.
Remove breathing apparatus only after contaminated clothing has been completely removed.
In case of irregular breathing or respiratory arrest provide artificial respiration.

After inhalation

Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.

After skin contact

Immediately wash with water and soap and rinse thoroughly.
Seek immediate medical advice.

Rub in calcium gluconate solution or calcium gluconate gel immediately.

After eye contact Rinse opened eye for several minutes under running water. Then consult a doctor.

After swallowing Do not induce vomiting; immediately call for medical help.

Information for doctor

Most important symptoms and effects, both acute and delayed

Causes severe skin burns.

Causes serious eye damage.

Indication of any immediate medical attention and special treatment needed No further relevant information available.

5 Fire-fighting measures

Extinguishing media

Suitable extinguishing agents Product is not flammable. Use fire-fighting measures that suit the surrounding fire.

Special hazards arising from the substance or mixture

If this product is involved in a fire, the following can be released:

Hydrogen fluoride (HF)

Advice for firefighters

Protective equipment:

Wear self-contained respirator.

Wear fully protective impervious suit.

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

Wear protective equipment. Keep unprotected persons away.

Ensure adequate ventilation

Environmental precautions: Do not allow material to be released to the environment without proper governmental permits.

Methods and material for containment and cleaning up:

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

Use neutralizing agent.

Dispose of contaminated material as waste according to section 13.

Ensure adequate ventilation.

Prevention of secondary hazards: No special measures required.

Reference to other sections

See Section 7 for information on safe handling

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

7 Handling and storage

Handling

Precautions for safe handling

Keep container tightly sealed.

Store in cool, dry place in tightly closed containers.

Ensure good ventilation at the workplace.

Open and handle container with care.

Prevent formation of aerosols.

Information about protection against explosions and fires: The product is not flammable

Conditions for safe storage, including any incompatibilities

Storage

Requirements to be met by storerooms and receptacles:

Unsuitable material for container: ceramic, glass

Unsuitable material for container: ceramic, glass

Information about storage in one common storage facility:

Water reacts with many metals to give hydrogen, often violently. Water is also incompatible with many reactive organic and inorganic chemicals.

Further information about storage conditions:

Keep container tightly sealed.

Store in cool, dry conditions in well sealed containers.

Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

Additional information about design of technical systems:

Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Control parameters

Components with limit values that require monitoring at the workplace:

Hydrogen fluoride (as F)

Country/Region	Limit Value
ACGIH TLV	3-Ceiling
Austria MAK	3
Belgium	3-STEL
Denmark TWA	2
Finland	3-Ceiling (skin)
France	3-VLE
Germany MAK	3
Hungary TWA	0.5 mg/m ³ ; 1 mg/m ³ -STEL
Japan OEL	3
Korea TLV	3-Ceiling
Netherlands	3.3-MAC-K
Norway TWA	0.8
Poland TWA	0.5 mg/m ³ ; 4 mg/m ³ -STEL
Russia TWA	3; 0.5 mg/m ³ -STEL

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USA

Product name: Dihydrogen hexafluorozirconate, 45% in 2%hydrofluoric acid

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Sweden 2-Ceiling
Switzerland MAK-W 1.8; 3.6-KZG-W
United Kingdom 3-STEEL
USA PEL 3

Zirconium and compounds, as Zr
mg/m³

ACGIH TLV 10; 10-STEEL, Not classifiable as human carcinogen
Australia TWA 5; 10-STEEL
Austria MAK 5
Denmark TWA 5
Finland TWA 5
Korea TLV 5
Hungary 5-STEEL
Poland TWA 5; 10-STEEL
Russia 6-STEEL
OSHA PEL 5

12021-95-3 Dihydrogen hexafluorozirconate, 45% in 2%hydrofluoric acid (100.0%)

PEL (USA) Long-term value: 5 mg/m³
as Zr
REL (USA) Short-term value: 10 mg/m³
Long-term value: 5 mg/m³
as Zr
TLV (USA) Short-term value: 10 mg/m³
Long-term value: 5 mg/m³
as Zr
EL (Canada) Short-term value: 10 mg/m³
Long-term value: 5 mg/m³
as Zr

Additional information: No data

Exposure controls

Personal protective equipment

General protective and hygienic measures

The usual precautionary measures for handling chemicals should be followed.

Keep away from foodstuffs, beverages and feed.

Remove all soiled and contaminated clothing immediately.

Wash hands before breaks and at the end of work.

Store protective clothing separately.

Avoid contact with the eyes and skin.

Maintain an ergonomically appropriate working environment.

Breathing equipment: Use self-contained respiratory protective device in emergency situations.

Protection of hands:

Impervious gloves

Check protective gloves prior to each use for their proper condition.

The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.

Eye protection:

Tightly sealed goggles

Full face protection

Body protection: Protective work clothing.

9 Physical and chemical properties

Information on basic physical and chemical properties

General Information

Appearance:

Form: Liquid
Color: Light green
Odor: Pungent
Odor threshold: Not determined.

pH-value: Not determined.

Change in condition

Melting point/Melting range: Not determined
Boiling point/Boiling range: Not determined
Sublimation temperature / start: Not determined

Flash point: Not applicable

Flammability (solid, gaseous): Not determined.

Ignition temperature: Not determined.

Decomposition temperature: Not determined.

Auto igniting: Not determined.

Danger of explosion: Product does not present an explosion hazard.

Explosion limits:

Lower: Not determined

Upper: Not determined

Vapor pressure: Not determined

Density at 20 °C (68 °F): 1.52 g/cm³ (12.684 lbs/gal)

Relative density: Not determined.

Vapor density: Not determined.

Evaporation rate: Not determined.

Solubility in / Miscibility with

Water: Fully miscible

Partition coefficient (n-octanol/water): Not determined.

Viscosity:

dynamic: Not determined.

kinematic: Not determined.

Other information: No further relevant information available.

10 Stability and reactivity

Reactivity: No information known.

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USA

Product name: **Dihydrogen hexafluorozirconate, 45% in 2%hydrofluoric acid**

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Chemical stability Stable under recommended storage conditions.
Thermal decomposition / conditions to be avoided: Decomposition will not occur if used and stored according to specifications.
Possibility of hazardous reactions
 Water reacts violently with alkali metals.
 Reacts with alkaline earth metals.
 Water reacts with many metals to give hydrogen, often violently. Water is also incompatible with many reactive organic and inorganic chemicals.
Conditions to avoid No further relevant information available.
Incompatible materials: No information known.
Hazardous decomposition products: Hydrogen fluoride

11 Toxicological information

Information on toxicological effects
Acute toxicity:
 Fatal if inhaled.
 Fatal in contact with skin.
 Fatal if swallowed.
 Danger through skin absorption.
 Swallowing will lead to a strong corrosive effect on mouth and throat and to the danger of perforation of esophagus and stomach.
LD/LC50 values that are relevant for classification:
 INH-HMN LCLo: 50 ppm/30M (HF)
 IHL-RAT LC50: 1276 ppm/1H (HF)
 IHL-MUS LC50: 342 ppm/1H (HF)
 INH-MKY LC50: 1774 ppm/1H (HF)
 INH-GPG LC50: 4327 ppm/15M (HF)
Skin irritation or corrosion: Causes severe skin burns.
Eye irritation or corrosion: Causes serious eye damage.
Sensitization: No sensitizing effects known.
Germ cell mutagenicity: No effects known.
Carcinogenicity: No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.
Reproductive toxicity: No effects known.
Specific target organ system toxicity - repeated exposure: No effects known.
Specific target organ system toxicity - single exposure: No effects known.
Aspiration hazard: No effects known.
Subacute to chronic toxicity:
 Hydrofluoric acid is extremely irritating and corrosive. It is destructive of tissues if comes in contact with, either as a vapor or as a liquid. Skin burns caused by hydrofluoric acid may appear to be stable only to get much worse several hours after exposure. Skin contact with hydrofluoric acid has led to industrial fatalities. Dilute solutions have a reduced effect.
 Inhalation of zirconium and zirconium compounds may cause pulmonary granulomas.
Subacute to chronic toxicity: No effects known.
Additional toxicological information: To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.



12 Ecological information

Toxicity
Aquatic toxicity: No further relevant information available.
Persistence and degradability No further relevant information available.
Bioaccumulative potential No further relevant information available.
Mobility in soil No further relevant information available.
Additional ecological information:
General notes:
 Do not allow product to reach ground water, water course or sewage system.
 Do not allow material to be released to the environment without proper governmental permits.
 Danger to drinking water if even small quantities leak into the ground.
 Avoid transfer into the environment.
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.
Other adverse effects No further relevant information available.

13 Disposal considerations

Waste treatment methods
Recommendation Consult state, local or national regulations to ensure proper disposal.
Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.
Recommended cleansing agent: Water, if necessary with cleansing agents.

14 Transport information

UN-Number	UN2922
DOT, IMDG, IATA	
UN proper shipping name	Corrosive liquids, toxic, n.o.s. (dihydrogen hexafluorozirconate solution)
DOT	CORROSIVE LIQUID, TOXIC, N.O.S. (dihydrogen hexafluorozirconate solution)
IMDG, IATA	
Transport hazard class(es)	
DOT	
	
Class	8 Corrosive substances.
Label	8+6.1
Class	8 (CT1) Corrosive substances
Label	8+6.1
IMDG, IATA	
	
Class	8 Corrosive substances.

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USA

Product name: **Dihydrogen hexafluorozirconate, 45% in 2%hydrofluoric acid**

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Label	8+6.1
Packing group DOT, IMDG, IATA	II
Environmental hazards:	Not applicable.
Special precautions for user	Warning: Corrosive substances
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable.
Transport/Additional information:	
DOT Marine Pollutant (DOT):	No
UN "Model Regulation":	UN2922, Corrosive liquids, toxic, n.o.s. (dihydrogen hexafluorozirconate solution), 8 (6.1), II

15 Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture
GHS label elements The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)
Hazard pictograms



GHS05 GHS06

Signal word Danger

Hazard statements

H300+H310+H330 Fatal if swallowed, in contact with skin or if inhaled.

H314 Causes severe skin burns and eye damage.

Precautionary statements

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P301+P310 IF SWALLOWED: Immediately call a POISON CENTER/ doctor/...

P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P320 Specific treatment is urgent (see on this label).

P361 Take off immediately all contaminated clothing.

P405 Store locked up.

P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

National regulations

All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.

All components of this product are listed on the Canadian Domestic Substances List (DSL).

SARA Section 313 (specific toxic chemical listings) Substance is not listed.

California Proposition 65

Prop 65 - Chemicals known to cause cancer Substance is not listed.

Prop 65 - Developmental toxicity Substance is not listed.

Prop 65 - Developmental toxicity, female Substance is not listed.

Prop 65 - Developmental toxicity, male Substance is not listed.

Information about limitation of use: For use only by technically qualified individuals.

Other regulations, limitations and prohibitive regulations

Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006. Substance is not listed.

The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.

Substance is not listed.

Annex XIV of the REACH Regulations (requiring Authorisation for use) Substance is not listed.

Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing SDS: Global Marketing Department

Date of preparation / last revision 11/24/2015 / -

Abbreviations and acronyms:

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

CAS: Chemical Abstracts Service (division of the American Chemical Society)

HMIS: Hazardous Materials Identification System (USA)

WHMIS: Workplace Hazardous Materials Information System (Canada)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

vPvB: very Persistent and very Bioaccumulative

ACGIH: American Conference of Governmental Industrial Hygienists (USA)

OSHA: Occupational Safety and Health Administration (USA)

NTP: National Toxicology Program (USA)

IARC: International Agency for Research on Cancer

EPA: Environmental Protection Agency (USA)