

[Hafnium Isopropoxide Isopropanol Adduct](#)

[Pricing >](#)

Linear Formula	(C <sub>6</sub> H <sub>14</sub> ) <sub>2</sub> HfO <sub>4</sub>
Pubchem CID	10216384
MDL Number	MFCD00070460
EC No.	N/A
IUPAC Name	hafnium(4+); propan-2-olate
SMILES	CC(C)[O-].CC(C)[O-].CC(C)[O-].CC(C)[O-].[Hf+4]
Inchl Identifier	InChI=1S/4C3H7O.Hf/c4*1-3(2)4;/h4*3H,1-2H3;/q4*-1;+4
Inchl Key	HRDRRWUDXWRQTB-UHFFFAOYSA-N

**Signal Word** Warning

**Hazard Statements** H228-H315-H319-H335

**Hazard Codes** F,Xi

**Risk Codes** 11-36/37/38

**Safety Statements** 26


**RTECS Number** N/A

**Transport Information** UN 3181 4.1/PG 3


**WGK Germany** 3

**GHS Pictograms**

[GHS07 Exclamation Point](#)



[GHS02 Flame](#)



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## SAFETY DATA SHEET

Date Accessed: 04/18/2024

## SECTION 1. IDENTIFICATION

**Product Identifiers:** All applicable American Elements product codes for CAS #2171-99-5

**Relevant identified uses of the substance:**  
Scientific research and development

Supplier details:  
American Elements  
10884 Weyburn Ave.  
Los Angeles, CA 90024  
Tel: +1 310-208-0551  
Fax: +1 310-208-0351

Emergency telephone number:  
Domestic, North America +1 800-424-9300  
International +1 703-527-3887

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## SECTION 2. HAZARDS IDENTIFICATION

Classification of the substance or mixture  
Classification according to Regulation (EC) No 1272/2008  
GHS02 Flame  
Flam. Sol. 2 H228 Flammable solid.  
GHS07  
Skin Irrit. 2 H315 Causes skin irritation.  
Eye Irrit. 2A H319 Causes serious eye irritation.  
STOT SE 3 H335 May cause respiratory irritation.  
Classification according to Directive 67/548/EEC or Directive 1999/45/EC  
Xi; Irritant  
R36/37/38: Irritating to eyes, respiratory system and skin.  
F; Highly flammable  
R11: Highly flammable.  
Information concerning particular hazards for human and environment:  
N/A  
Hazards not otherwise classified  
No data available  
Label elements  
Labelling according to Regulation (EC) No 1272/2008  
The substance is classified and labeled according to the CLP regulation.  
Hazard pictograms



GHS02  
GHS07  
Signal word  
Warning  
Hazard statements  
H228 Flammable solid.  
H315 Causes skin irritation.  
H319 Causes serious eye irritation.  
H335 May cause respiratory irritation.  
Precautionary statements  
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.  
P280 Wear protective gloves.  
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
WHMIS classification  
B4 - Flammable solid  
D2B - Toxic material causing other toxic effects  
Classification system  
HMIS ratings (scale 0-4)  
(Hazardous Materials Identification System)  
HEALTH  
FIRE  
REACTIVITY  
1  
2  
1  
Health (acute effects) = 1  
Flammability = 2  
Physical Hazard = 1  
Other hazards  
Results of PBT and vPvB assessment  
PBT:  
N/A  
vPvB:  
N/A

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### **SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS**

Substances  
CAS No. / Substance Name:  
2171-99-5 Hafnium(IV) isopropoxide isopropanol complex  
Additional information:  
Hafnium is routinely found with a low level of zirconium since separation of the two elements is difficult.  
Additional information:  
This material builds up pressure slowly. Vent pressure, if any, upon receipt. Vent every 3 months.

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## **SECTION 4. FIRST AID MEASURES**

Description of first aid measures

If inhaled:

Supply patient with fresh air. If not breathing, provide artificial respiration. Keep patient warm.

Seek immediate medical advice.

In case of skin contact:

Immediately wash with soap and water; rinse thoroughly.

Seek immediate medical advice.

In case of eye contact:

Rinse opened eye for several minutes under running water. Consult a physician.

If swallowed:

Seek medical treatment.

Information for doctor

Most important symptoms and effects, both acute and delayed

No data available

Indication of any immediate medical attention and special treatment needed

No data available

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## **SECTION 5. FIREFIGHTING MEASURES**

Extinguishing media

Suitable extinguishing agents

CO<sub>2</sub>, sand, extinguishing powder. Do not use water.

Special hazards arising from the substance or mixture

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

Carbon monoxide and carbon dioxide

Metal oxide fume

Advice for firefighters

Protective equipment:

Wear self-contained respirator.

Wear fully protective impervious suit.

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## **SECTION 6. ACCIDENTAL RELEASE MEASURES**

Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Keep unprotected persons away.

Ensure adequate ventilation

Keep away from ignition sources

Environmental precautions:

Do not allow material to be released to the

environment without official permits.  
Do not allow product to enter drains, sewage systems,  
or other water courses.  
Do not allow material to penetrate the ground or soil.  
Methods and materials for containment and cleanup:  
Keep away from ignition sources.  
Ensure adequate ventilation.  
Prevention of secondary hazards:  
Keep away from ignition sources.  
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.

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## **SECTION 7. HANDLING AND STORAGE**

### Handling

Precautions for safe handling  
Handle under dry protective gas.  
Keep container tightly sealed.  
Store in cool, dry place in tightly closed containers.  
Ensure good ventilation at the workplace.  
Information about protection against explosions and  
fires:  
Protect against electrostatic charges.  
Conditions for safe storage, including any  
incompatibilities  
Requirements to be met by storerooms and  
receptacles:  
Store in a cool location.  
Information about storage in one common storage  
facility:  
Store away from oxidizing agents.  
Store away from water/moisture.  
Further information about storage conditions:  
Store under dry inert gas.  
This product is moisture sensitive.  
Keep container tightly sealed.  
Store in cool, dry conditions in well-sealed containers.  
Protect from humidity and water.  
Specific end use(s)  
No data available

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## **SECTION 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:

Hafnium, metal and compounds as Hf

mg/m<sup>3</sup>

ACGIH TLV 0.5

Austria MAK 0.5

Belgium TWA 0.5

Denmark TWA 0.5

Finland TWA 0.5

France VME 0.5

Germany MAK 0.5

Ireland TWA 0.5; 1.5-STEL

Korea TLV 0.5

Netherlands MAC-TGG 0.5

Norway TWA 0.5

Poland TWA 0.5

Switzerland 0.5-MAK-W

United Kingdom TWA 0.5; 1.5-STEL

USA PEL 0.5

Additional information:

No data

Exposure controls

Personal protective equipment

Follow typical protective and hygienic practices for handling chemicals.

Keep away from foodstuffs, beverages and feed.

Remove all soiled and contaminated clothing immediately.

Wash hands before breaks and at the end of work.

Avoid contact with the eyes and skin.

Maintain an ergonomically appropriate working environment.

Breathing equipment:

Use suitable respirator when high concentrations are present.

Protection of hands:

Impervious gloves

Inspect gloves prior to use.

Suitability of gloves should be determined both by material and quality, the latter of which may vary by manufacturer.

Penetration time of glove material (in minutes)

No data available

Eye protection:

Safety glasses

Body protection:

Protective work clothing.

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## SECTION 9. PHYSICAL AND CHEMICAL

## PROPERTIES

Information on basic physical and chemical properties

Appearance:

Form: Solid

Odor: No data available

Odor threshold: No data available.

pH: N/A

Melting point/Melting range: No data available

Boiling point/Boiling range: No data available

Sublimation temperature / start: No data available

Flash point: N/A

Flammability (solid, gas)

Highly flammable.

Ignition temperature: No data available

Decomposition temperature: No data available

Autoignition: No data available.

Danger of explosion: No data available.

Explosion limits:

Lower: No data available

Upper: No data available

Vapor pressure: N/A

Density: No data available

Relative density

No data available.

Vapor density

N/A

Evaporation rate

N/A

Solubility in Water (H<sub>2</sub>O): Reacts

Partition coefficient (n-octanol/water): No data available.

Viscosity:

Dynamic: N/A

Kinematic: N/A

Other information

No data available

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## SECTION 10. STABILITY AND REACTIVITY

Reactivity

No data available

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

Reacts with water

Conditions to avoid

No data available

Incompatible materials:

Oxidizing agents

Water/moisture  
Hazardous decomposition products:  
Carbon monoxide and carbon dioxide  
Metal oxide fume

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## **SECTION 11. TOXICOLOGICAL INFORMATION**

Information on toxicological effects

Acute toxicity:

No effects known.

LD/LC50 values that are relevant for classification:

No data

Skin irritation or corrosion:

Causes skin irritation.

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:

May cause respiratory irritation.

Aspiration hazard:

No effects known.

Subacute to chronic toxicity:

Hafnium compounds may be irritating to the skin and eyes.

There are reports of liver damage from hafnium exposure.

Subacute to chronic toxicity:

No effects known.

Subacute to chronic toxicity:

Isopropyl alcohol, if formed, may act as a local irritant and in high concentrations as a narcotic with symptoms such as headache, nausea, dizziness, vomiting, mental depression, anesthesia, and coma. Similar symptoms may be caused by ingestion. It can cause corneal burns on contact with the eyes and has caused teratogenic, mutagenic and reproductive effects in laboratory animals.

Additional toxicological information:

To the best of our knowledge the acute and chronic



toxicity of this substance is not fully known.

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## **SECTION 12. ECOLOGICAL INFORMATION**

Toxicity

Aquatic toxicity:

No data available

Persistence and degradability

No data available

Bioaccumulative potential

No data available

Mobility in soil

No data available

Additional ecological information:

Do not allow material to be released to the environment without official permits.

Do not allow undiluted product or large quantities to reach groundwater, water courses, or sewage systems.

Avoid transfer into the environment.

Results of PBT and vPvB assessment

PBT:

N/A

vPvB:

N/A

Other adverse effects

No data available

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## **SECTION 13. DISPOSAL CONSIDERATIONS**

Waste treatment methods

Recommendation

Consult official regulations to ensure proper disposal.

Uncleaned packagings:

Recommendation:

Disposal must be made according to official regulations.

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## **SECTION 14. TRANSPORT INFORMATION**

UN-Number

DOT, IMDG, IATA

UN3181

UN proper shipping name

DOT

Metal salts of organic compounds, flammable, n.o.s.

(Hafnium(IV) isopropoxide

isopropanol complex)

IMDG, IATA

METAL SALTS OF ORGANIC COMPOUNDS,  
FLAMMABLE, N.O.S. (Hafnium(IV)  
isopropoxide isopropanol complex)  
Transport hazard class(es)  
DOT  
Class  
4.1 Flammable solids, self-reactive substances and  
solid desensitised explosives.  
Label  
4.1  
Class  
4.1 (F3) Flammable solids, self-reactive substances  
and solid desensitised explosives  
Label  
4.1  
IMDG, IATA  
Class  
4.1 Flammable solids, self-reactive substances and  
solid desensitised explosives.  
Label  
4.1  
Packing group  
DOT, IMDG, IATA  
III  
Environmental hazards:  
N/A  
Special precautions for user  
Warning: Flammable solids, self-reactive substances  
and solid desensitised explosives  
EMS Number:F-A,S-I  
Segregation groups  
Heavy metals and their salts (including their  
organometallic compounds)  
Transport in bulk according to Annex II of  
MARPOL73/78 and the IBC Code  
N/A  
Transport/Additional information:  
DOT  
Marine Pollutant (DOT):  
No  
UN "Model Regulation":  
UN3181, Metal salts of organic compounds,  
flammable, n.o.s. (Hafnium(IV)  
isopropoxide isopropanol complex), 4.1, III

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## **SECTION 15. REGULATORY INFORMATION**

Safety, health and environmental  
regulations/legislation specific for the substance or  
mixture  
National regulations  
This product is not listed in the U.S. Environmental

Protection Agency Toxic Substances Control Act  
Chemical Substance Inventory. Use of this product is  
restricted to research and development only. This  
product must be used by or directly under the  
supervision of a technically qualified individual as  
defined by TSCA. This product must not be used for  
commercial purposes or in formulations for  
commercial purposes.  
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.  
REACH - Pre-registered substances  
Substance is not listed.  
Chemical safety assessment:  
A Chemical Safety Assessment has not been carried  
out.

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## **16. OTHER INFORMATION**

Safety Data Sheet according to Regulation (EC) No.  
1907/2006 (REACH). The above information is  
believed to be correct but does not purport to be all  
inclusive and shall be used only as a guide. The  
information in this document is based on the present  
state of our knowledge and is applicable to the  
product with regard to appropriate safety precautions.  
It does not represent any guarantee of the properties  
of the product. American Elements shall not be held  
liable for any damage resulting from handling or from  
contact with the above product. See reverse side of

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