GHS Material Safety Data Sheet

MSDS No. : HFR01LAEG

Date Issued: 2001/09/05
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Section 1. Identification of the substance or mixture and of the supplier

1.1 Product Information

Product name: Hf(O-t-C_4H_9)$_4$ Hafnium tetra-t-butoxide

Product number	Purity	Form
HFR11LB	99.99%(4N) : excluding Zr	liquid

1.2 Company Information:

Manufacturer : Kojundo Chemical Laboratory Co., Ltd.
1-28, 5-chome, Chiyoda, Sakado-shi, Saitama Japan 350-0284
Phone: +81-49-284-1511 Fax: +81-49-284-1351

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Section 2. Hazards identification

GHS Classification

Health Hazards	Environmental Hazards	Physical Hazards
No data available	No data available	No data available

GHS Label:

Pictograms or symbols No data available

Warning word: Not applicable	
Hazard information	**Description of precaution**
Not applicable	Not applicable

Additional hazard information :

May be ignited by heat, sparks or flames.
In case of fire, may liberate toxic gases/ fume.
With respect to additional hazard information, see Section 11.

Section 3. Composition / information on ingredients

Chemical or common name:	Hafnium(IV) tetra-tert-butoxide
Single Substance or Compound:	Single substance
Chemical formula:	$Hf[(OC(CH_3)_3]_4$
Composition:	100%
CAS #:	2172-02-3
RTECS#:	No data available
TSCA inventory :	Not listed
EINECS#:	No data available

Section 4. First aid measures

Eye contact: Promptly rinse eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes and get medical attention.

Skin contact: Remove immediately all contaminated clothing. Wipe off the product immediately by tissue or soft cloth, etc. Promptly flush contaminated skin with soap or mild detergent and water. Contact physician if irritation continues.

Ingestion: Rinse mouth and throat with water. Get medical attention immediately.

Inhalation: Remove the exposed person immediately and provide fresh air.
Get medical attention.

Section 5. Fire fighting measures

Chemical Name	Flash Point	Autoignition Temprature	Explosion Level (Lower-Upper)	Vapour Pressure
$Hf(O\text{-}t\text{-}C_4H_9)_4$	–	–	–	–

Extinguishing agents:
Carbon dioxide, Dry chemical powder, water spray, fog or alcohol-resistant form.
DO NOT use a direct water stream.

Fire fighting: Flammable material.
Remove containers to safe place if possible.
Use water spray to Cool down nearby structures and containers.
Self-contained breathing apparatus and full protective clothing should be used, if the material is involved in fire.

Combustion products:
Burning material releases toxic organic fumes, toxic gases of carbon monoxide / carbon dioxide.

Section 6. Accidental release measures

Personal Precaution: Workers should use protective wears to prevent contact with the spilt adhesive and inhalation of its vapor.

Environmental hazard precaution:
Shut off leak if without risk.
Prevent flow out to river, etc. so as not to badly affect.

Methods for containment and cleaning up:
Remove all sources of ignition.
Avoid unnecessary contacts with spills.
Indoor leakage: Ventilate as much as possible until the cleaning is completed.
Outdoor leakage: Work from the windward and evacuate the leeward crowd.
Absorb or cover with inert material(e.g. vermiculite, sand, earth or other suitable absorbent), then place in closed dry container. Ventilate area and carefully wash spill site with plenty of water after material pick up.

Section 7. Handling and storage

Precautions to be taken in handling:

Safe handling: Handle the material in a dry inert gas atmosphere, utilizing glove bag or glove box. Keep away from moisture when handling.
Keep container or bottle tightly closed when not in use.
Avoid prolonged or repeated exposure.

Handling worker wears suitable protective clothing.
Keep away from heat, sparks and naked flame.

Precautions to be taken in storage:

General precautions: Store the material in a sealed container.
Store in a cool, dry, well ventilated and dark place away from incompatible materials.
Keep away from any heat, sparks, and flames.

Section 8. Exposure controls / personal protection

Exposure guideline: ACGIH(2012) Hafnium and compounds (as Hf) TLV-TWA = 0.5 mg/m^3
OSHA(2006) Hafnium PEL-TWA = 0.5 mg/m^3

Facility measures: Local ventilation of closed work room or total proper ventilation to prevent inhalation.

Protective ware: Wear appropriate NIOSH/MSHA-approved respirator, safety goggles, impervious gloves, protective wear, protective boots.

Section 9. Physical and chemical properties

Color and Form:	Colorless liquid
Chemical formula:	$Hf[(OC(CH_3)_3]_4$
Formula weigh	470.95
Melting point:	8 ℃
Boiling point:	28 ℃/ 13.3Pa
Density:	1.17 g/cm^3
Solubility:	Water: Decomposes
	Dissoluble: Miscible with toluene, hexane, tetrahydrofuran.
Flammable:	Flammable substance
Oxidation:	No data available

Section 10. Stability and reactivity

Stability: Stable in an inert gas under room temperature.
Decomposed by moisture in the air.

Reactivity

Incompatibility: Acids, oxidizing agents

Conditions to avoid: Heat, sparks and flames.
Water, Moisture

Hazard decomposition products

Carbon monoxide, carbon dioxide, metallic oxide of hafnium and toxic organic fumes.

Section 11. Toxicological information

Acute toxicity :	GHS : No data available
Skin corrosive / irritation:	GHS : No data available
Serious eye damage / irritation:	GHS : No data available
Respiratory sensitization:	GHS : No data available
Skin sensitization:	GHS : No data available
Germ cell mutagenicity:	GHS ; No data available
Carcinogenicity:	GHS ; No data available

Reproductive toxicity: GHS ; No data available
Specific target organ toxicity
—single exposure: GHS ; No data available
—repeated exposure: GHS ; No data available
Aspiration hazard: GHS ; No data available

Section 12. Ecological information

Ecotoxicity:
Hazards to the aquatic environme
—acute toxicity: GHS ; No data available
—chronic toxicity: GHS ; No data available
Hazrdous the ozone layer: GHS ; No data available
No Freon or Halon
Degradability: No data available
Bioaccumulative potential: No data available

Section 13. Disposal considerations

Disposal method: User of the product should contract with the local government or licensed 'Industrial Waste Haulers' for disposal of waste.

Section 14. Transport information

UN number: 1993
IATA shipping name: Flammable liquid, n.o.s.
IATA classification: Hazardous Class 3 (Flammable liquids)
IATA packing group: III
HS code: 2905.14
Marine pollution: None

Section 15. Regulatory information

TSCA inventory : not listed.
Please refer to any other local / national measures that may be relevant.

Section 16. Other information

The information described above is believed to be correct. However, Kojundo Chemical Lab. makes no representation, warranty nor guarantee of any kind with respect to the information on this data sheet or any use of the product based upon this information.