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Safety Data Sheet

1. Chemical product and company identification

Product name : Zirconium, cube, 4N

Company information

Name of manufacturer	:	KANTO CHEMICAL CO., INC.
Address	:	2-1, Nihonbashi, Muromachi 2-Chome, Chuo-Ku, Tokyo, 103-0022, JP
Name of section	:	Business Administration Department, Reagent Division
Telephone number	:	+81-3-6214-1090
Facsimile number	:	+81-3-3241-1047
Mail address	:	BC32@kanto.co.jp
Reference No	:	48059
Recommended use	:	For research use only
Restrictions on use	:	Seek expert judgment when using the product for applications other than those recommended.

2. Hazards identification

GHS classification

Health hazards Specific target organ toxicity (single exposure) Category 3 (respiratory tract irritation.)

Hazard pictograms

Signal word : Warning

Hazard statements : May cause respiratory irritation

Precautionary statements

Prevention	:	Avoid breathing dust. Use only outdoors or in a well-ventilated area.
Response	:	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or doctor if you feel unwell.
Storage	:	Store in a well-ventilated place. Keep container tightly closed. Store locked up.
Disposal	:	Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

3. Composition/information on ingredients

Distinction of substance or mixture : Substance

Chemical name	Concentration (%)	Formula	TSCA	EC-No.	CAS RN
Zirconium	≥ 99.99	Zr	Listed	231-176-9	7440-67-7

4. First aid measures

First aid measures

First-aid measures after inhalation : Remove the victim to fresh air, and make him blow his nose and gargle.

First-aid measures after skin contact : Wash the affected areas under running water.

First-aid measures after eye contact : Wash the affected areas under running water.

First-aid measures after ingestion : Rinse mouth. Do not induce vomiting. Get medical attention immediately.

Self protection of the first-aider : Rescuers should wear proper protective equipment like rubber gloves, goggles.

5. Fire fighting measures

Suitable extinguishing media : Water, dry chemical powder, carbon dioxide, dry sand, foam

Unsuitable extinguishing media : None

Firefighting instructions : Move containers from fire area if it can be done without risk, if not possible, apply water from a safe distance to cool and protect surrounding area.

Fight fire from windward.

Dry chemical powder, carbon dioxide or dry sand should be used for small fires. Foam extinguisher is effective for a large scale fire.

Personal protection (Emergency response) : Wear breathing apparatus.

6. Accidental release measures

Personal Precautions, Protective Equipment and Emergency Procedures

General measures : Wear proper protective equipment and avoid contact with skin and inhalation of dust. Conduct operations from upwind and evacuate people downwind.

Environmental precautions

Environmental precautions : Attention should be given to avoid damage to the environment by flowing of spillage to rivers.

Methods and Equipment for Containment and Cleaning up

For containment : Absorb spill with inert material (e.g, diatomaceous earth, sand) and flush spillage area with copious amounts of water.

7. Handling and storage

Handling

Technical measures : Wear appropriate protective equipment to avoid contact with skin or inhalation of dust.

Precautions for safe handling : Avoid formation of dust and aerosols.

Storage

Storage conditions	:	Store in a dark, cool place and tightly closed.
Material used in packaging/containers	:	Glass, polyethylene, polypropylene.

8. Exposure controls / Personal protection equipment

ACGIH TWA	5 mg/m³
ACGIH STEL	10 mg/m³

Appropriate engineering controls : Install a local ventilation system in case of dusty condition.

Protective equipment

Respiratory protection	:	Dust mask
Hand protection	:	Impervious protective gloves
Eye protection	:	Safety goggles
Skin and body protection	:	Protective clothing, protective boots

9. Physical and chemical properties

Physical state	:	Solid
Color	:	Silver white - silver gray
Odor	:	Odorless
pH	:	No data available
Melting point	:	1855 ° C
Freezing point	:	No data available
Boiling point	:	3577 ° C
Flash point	:	No data available
Auto-ignition temperature	:	No data available
Decomposition temperature	:	No data available
Flammability	:	Flammable solid
Vapor pressure	:	No data available
Relative density	:	No data available
Density	:	6.4 g/cm³ (20℃)
Relative gas density	:	No data available
Solubility	:	Water: Insoluble.
Partition coefficient n-octanol/water (log Pow)	:	No data available
Explosive limits (Vol-%)	:	No data available
Viscosity, kinematic	:	No data available
Particle characteristics	:	No data available

10. Stability and reactivity

Reactivity	:	Forms nitrides and carbides when heated.
Chemical stability	:	Stable under normal conditions. The powder ignites easily in air and is rapidly oxidized when heated. When the bulk material is heated, an oxide film forms on the surface, raising the melting point and causing it to become

		brittle.
Possibility of hazardous reactions	:	Stable under normal conditions of use.
Conditions to avoid	:	Light, heat.
Incompatible materials	:	Not in particular.
Hazardous decomposition products	:	Zirconium oxide.

11. Toxicological information

Acute toxicity (oral)	:	Classification not possible
Acute toxicity (dermal)	:	Classification not possible
Acute toxicity (inhalation)	:	No classification (gas) No classification (vapor) Classification not possible (dust, mist)
Skin corrosion/irritation	:	Classification not possible
Serious eye damage/irritation	:	Classification not possible
Respiratory sensitization	:	Classification not possible Classification not possible due to lack of data. Besides, zirconium and zirconium compounds were classified as respiratory sensitizing substance in DFGOT vol. 12. However, this substance was classified as "Classification not possible" since it could not be determined whether it was applicable to this substance or not.
Skin sensitization	:	Classification not possible Classification not possible due to lack of data. Besides, there are epidemiological studies that this substance and zirconium compounds cause epithelioid granuloma skin sensitization to humans, and a report that zirconium compounds cause delayed hypersensitivity to experimental animals. Also, this substance and zirconium compounds were classified as a skin sensitizer in DFGOT vol. 12. But, it was not judged as sensitizer by ACGIH because sufficient data were not available. From the above, this substance was classified as "Classification not possible."
Germ cell mutagenicity	:	Classification not possible
Carcinogenicity	:	Classification not possible There is no information on carcinogenicity in humans. As for experimental animals, in a study in which rats were orally given 5 ppm of zirconium sulfate for their lifetime, no difference in survival time and tumor incidence between the zirconium administered group and the control group was observed. Zirconium and zirconium compounds were classified in A4 for carcinogenicity by ACGIH based on the test results of rats. Therefore, it was classified as "Classification not possible" for this hazard class.
Reproductive toxicity	:	Classification not possible
STOT-single exposure	:	May cause respiratory irritation Based on a description that this substance is irritating to the respiratory tract, this substance was classified in category 3 (respiratory tract irritation).

STOT-repeated exposure	:	Classification not possible Classification not possible due to lack of data. Besides, in 22 workers who were exposed to fumes of zirconium (zirconium chloride, zirconium oxide, metallic zirconium) in a refining and reduction process for 1-5 years (the amount of exposure was not specified), no pulmonary granulomas were observed, but mild bronchial asthma in 2 workers and chronic bronchitis in 5 workers were observed. However, there are reports that some of these people had also been exposed to chlorine. Also, based on the same information, it is described in ACGIH and PATTY that there were no (striking) abnormalities related to zirconium.
Aspiration hazard	:	Classification not possible

12. Ecological information

Ecotoxicity

Aquatic acute	:	Classification not possible
Aquatic chronic	:	Classification not possible

Persistence and degradability

No additional information available

Bioaccumulative potential

No additional information available

Mobility in soil

No additional information available

Hazardous to the ozone layer

Hazardous to the ozone layer	:	Classification not possible

13. Disposal considerations

Ecological waste information	:	Bury in a landfill site approved for the disposal of chemical and hazardous wastes. Or entrust approved waste disposal companies with the disposal.
Contaminated container and packaging	:	In case of disposal of empty bottles, dispose bottles after removing the content thoroughly.

14. Transport information

International Regulations

Transport by sea(IMDG)

UN-No. (IMDG)	:	Not applicable
Proper Shipping Name (IMDG)	:	Not applicable
Packing group (IMDG)	:	Not applicable
Transport hazard class(es) (IMDG)	:	Not applicable

Air transport(IATA)

UN-No. (IATA)	:	Not applicable
Proper Shipping Name (IATA)	:	Not applicable
Packing group (IATA)	:	Not applicable
Transport hazard class(es) (IATA)	:	Not applicable
Marine pollutant	:	Not applicable

15. Regulatory information

Regulatory information with regard to this substance in your country or region should be examined by your own responsibility.

16. Other information

Data sources : NITE Chemical Risk Information Platform (NITE-CHRIP), National Institute of Technology and Evaluation.
Encyclopaedia Chimica, Kyoritsu Shuppan Co, Ltd. (1963) .
ECHA (European Chemicals Agency).

The information contained herein is based on several references and the present state of our knowledge. However the SDS does not always cover all information about the product, handle the product carefully.The information is intended to ordinary usage, in case of particular handlings, conduct appropriate safety measurements.The information herein is only provision of information, and it does not represent a guarantee the properties of the product.The Safety Data Sheet(SDS) is prepared based on JIS Z 7253:2019.