

Barium Zirconate	Pricing >
Barium Zirconate Nanoparticles / Nanopowder	Pricing >
Barium Zirconate Sputtering Target	Pricing >
Linear Formula	BaZrO ₃
Pubchem CID	24863952
MDL Number	MFCD00014189
EC No.	234-546-8
IUPAC Name	barium(2+); oxygen(2-); zirconium(4+)
Beilstein/Reaxys No.	N/A
SMILES	[Ba+2].[O-][Zr]([O-])=O
Inchl Identifier	InChI=1S/Ba.3O.Zr/q+2;;2*-1;
Inchl Key	DQBAOWPVHRWLJC-UHFFFAOYSA-N
Signal Word	Warning
Hazard Statements	H302-H332
Hazard Codes	Xn
Risk Codes	20/22
Safety Statements	28
RTECS Number	CR0875000
Transport Information	N/A
WGK Germany	1

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SAFETY DATA SHEET

Date Accessed: 04/18/2024

Date Revised: 01/15/2022

SECTION 1. IDENTIFICATION

Product Identifiers: All applicable American Elements product codes for CAS #12009-21-1

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

SECTION 2. HAZARDS IDENTIFICATION

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

GHS07

Acute Tox. 4 H302 Harmful if swallowed.

Acute Tox. 4 H332 Harmful if inhaled.

Hazards not otherwise classified No data available

GHS label elements, including precautionary
statements

Hazard pictograms



GHS07

Signal word Warning

Hazard statements

H302+H332 Harmful if swallowed or if inhaled.

Precautionary statements

P261 Avoid breathing
dust/fume/gas/mist/vapors/spray.

P264 Wash thoroughly after handling.

P304+P340 IF INHALED: Remove person to fresh air
and keep comfortable for breathing.

P301+P312 IF SWALLOWED: Call a POISON
CENTER/doctor/if you feel unwell.

P312 Call a POISON CENTER/doctor/if you feel
unwell.

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

WHMIS classification

D1B - Toxic material causing immediate and serious
toxic effects

Classification system

HMIS ratings (scale 0-4)

(Hazardous Materials Identification System)

HEALTH

FIRE

REACTIVITY

2

0

0

Health (acute effects) = 2
Flammability = 0
Physical Hazard = 0
Other hazards
Results of PBT and vPvB assessment
PBT: N/A
vPvB: N/A

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substances
CAS No. / Substance Name:
12009-21-1 Barium zirconium oxide
Identification number(s):
EC number: 234-546-8
Index number: 056-002-00-7
Additional information: Zirconium is routinely found with a low level of hafnium since separation of the two elements is difficult.

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.
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.

SECTION 5. FIREFIGHTING 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:
Barium oxide
Metal oxide fume
Advice for firefighters
Protective equipment:
Wear self-contained respirator.
Wear fully protective impervious suit.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Keep unprotected persons away.

Ensure adequate ventilation

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

Methods and materials for containment and cleanup:

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.

SECTION 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.

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

Conditions for safe storage, including any incompatibilities

Requirements to be met by storerooms and receptacles: No special requirements.

Information about storage in one common storage facility: Store away from oxidizing agents.

Further information about storage conditions:

Keep container tightly sealed.

Store in cool, dry conditions in well-sealed containers.

Specific end use(s) No data available

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:

Barium, and soluble compounds, as Ba
mg/m³

ACGIH TLV 0.5; Not classified as a human
carcinogen

Austria MAK 0.5

Belgium TWA 0.5

Denmark TWA 0.5

Finland TWA 0.5

Germany MAK 0.5 (total dust)

Hungary 0.5-STEL

Ireland TWA 0.5

Korea TLV 0.5

Netherlands MAC-TGG 0.5

Norway TWA 0.5

Poland TWA 0.5; 1.5-STEL

Sweden TWA 0.5

Switzerland MAK-W 0.5

United Kingdom LTEL 0.5

USA PEL 0.5

Zirconium and compounds, as Zr
mg/m³

ACGIH TLV 10; 10-STEL, Not classifiable as human
carcinogen

Australia TWA 5; 10-STEL

Austria MAK 5

Denmark TWA 5

Finland TWA 5

Korea TLV 5

Hungary 5-STEL

Poland TWA 5; 10-STEL

Russia 6-STEL

OSHA PEL 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.

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.

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

Eye protection: Safety glasses
Body protection: Protective work clothing.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance:

Form: Powder or solid in various forms

Color: Off-white

Odor: Odorless

Odor threshold: No data available.

pH: N/A

Melting point/Melting range: 2500 °C (4532 °F)

Boiling point/Boiling range: No data available

Sublimation temperature / start: No data available

Flash point: N/A

Flammability (solid, gas) No data available.

Ignition temperature: No data available

Decomposition temperature: No data available

Autoignition: No data available.

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

Explosion limits:

Lower: No data available

Upper: No data available

Vapor pressure: N/A

Density at 20 °C (68 °F): 5.52 g/cm³ (46.064 lbs/gal)

Relative density No data available.

Vapor density N/A

Evaporation rate N/A

Solubility in / Miscibility with

Water: No data available

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

Viscosity:

Dynamic: N/A

Kinematic: N/A

Other information No data available

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 No dangerous reactions known

Conditions to avoid No data available

Incompatible materials: Oxidizing agents
Hazardous decomposition products:
Barium oxide
Metal oxide fume

SECTION 11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

Acute toxicity:

Harmful if inhaled.

Harmful if swallowed.

LD/LC50 values that are relevant for classification: No data

Skin irritation or corrosion: Irritant to skin and mucous membranes.

Eye irritation or corrosion: Irritating effect.

Sensitization: No sensitizing effects known.

Germ cell mutagenicity: No effects known.

Carcinogenicity:

EPA-D: Not classifiable as to human carcinogenicity: inadequate human and animal evidence of carcinogenicity or no data are available.

ACGIH A4: Not classifiable as a human carcinogen:

Inadequate data on which to classify the agent in terms of its carcinogenicity in humans and/or animals.

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:

Barium compounds may cause severe gastroenteritis, including abdominal pain, vomiting and diarrhea, tremors, faintness, paralysis of the arms and legs, and slow

or irregular heartbeat. Severe cases may produce collapse and death due to respiratory failure. Soluble barium compounds are more likely to cause these effects

than insoluble compounds. Inhalation of fumes may cause sore throat, coughing, labored breathing, and irritation of the respiratory tract as well as the above symptoms.

Inhalation of zirconium and zirconium compounds may cause pulmonary granulomas.

Subacute to chronic toxicity:

The Registry of Toxic Effects of Chemical Substances (RTECS) reports the following effects in laboratory animals:

Nutritional and Gross Metabolic - weight loss or decreased weight gain.

Lungs, Thorax, or Respiration - changes in pulmonary vascular resistance.

Lungs, Thorax, or Respiration - fibrosis, focal (pneumoconiosis).

Lungs, Thorax, or Respiration - pleural thickening

Additional toxicological information: To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

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

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.

SECTION 14. TRANSPORT INFORMATION

Not a hazardous material for transportation.

UN-Number

DOT, IMDG, IATA None

UN proper shipping name

DOT, IMDG, IATA None

Transport hazard class(es)

DOT, ADR, IMDG, IATA

Class None

Packing group

DOT, IMDG, IATA None

Environmental hazards: N/A
Special precautions for user N/A
Transport in bulk according to Annex II of
MARPOL73/78 and the IBC Code N/A
Transport/Additional information: Not dangerous
according to the above specifications.
DOT
Marine Pollutant (DOT): No

SECTION 15. REGULATORY INFORMATION

Safety, health and environmental
regulations/legislation specific for the substance or
mixture
GHS label elements, including precautionary
statements
Hazard pictograms
GHS07
Signal word Warning
Hazard statements
H302+H332 Harmful if swallowed or if inhaled.
Precautionary statements
P261 Avoid breathing
dust/fume/gas/mist/vapors/spray.
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P304+P340 IF INHALED: Remove person to fresh air
and keep comfortable for breathing.
P301+P312 IF SWALLOWED: Call a POISON
CENTER/doctor/if you feel unwell.
P312 Call a POISON CENTER/doctor/if you feel
unwell.
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 Non-Domestic Substances List (NDSL).
SARA Section 313 (specific toxic chemical listings)
12009-21-1 Barium zirconium oxide
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.

This product contains barium and is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40CFR372.

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

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 invoice or packing slip for additional terms and conditions of sale. COPYRIGHT 1997-2022 AMERICAN ELEMENTS. LICENSED GRANTED TO MAKE UNLIMITED PAPER COPIES FOR INTERNAL USE ONLY.