

Zinc(IV) Titanate		Pricing >
Linear Formula	Zn ₂ TiO ₄	
Pubchem CID	166015	
MDL Number	N/A	
EC No.	234-850-0	
IUPAC Name	dizinc; oxygen(2-); titanium(4+)	
Beilstein/Reaxys No.	N/A	
SMILES	[O-2].[O-2].[O-2].[O-2].[Ti+4].[Zn+2].[Zn+2]	
Inchl Identifier	InChI=1S/4O.Ti.2Zn/q4*-2;+4;2*+2	
Inchl Key	ZBFOLPMOGPIUGP-UHFFFAOYSA-N	
Signal Word	Warning	
Hazard Statements	H302	
Hazard Codes	Xn	
Risk Codes	22	
Safety Statements	36	
RTECS Number	N/A	
Transport Information	N/A	
WGK Germany	3	

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SAFETY DATA SHEET

Date Accessed: 05/03/2024

Date Revised: 01/15/2022

SECTION 1. IDENTIFICATION

Product Identifiers: All applicable American Elements product codes for CAS #12036-69-0

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 H332 Harmful if inhaled.

Hazards not otherwise classified

No data available

GHS label elements

GHS label elements, including precautionary
statements

Hazard pictograms



GHS07

Signal word

Warning

Hazard statements

H332 Harmful if inhaled.

Precautionary statements

P261

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

P271

Use only outdoors or in a well-ventilated area.

P304+P340 IF INHALED: Remove victim to fresh air
and keep at rest in a position comfortable for
breathing.

P312

Call a POISON CENTER/doctor if you feel unwell.

WHMIS classification

Not controlled

Classification system

HMIS ratings (scale 0-4)

(Hazardous Materials Identification System)

Health (acute effects) = 2

Flammability = 0

Physical Hazard = 1

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:

12036-69-0 Zinc titanium oxide

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

Harmful if inhaled.

Indication of any immediate medical attention and special treatment needed

No data available

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:

Zinc oxide

Titanium oxides

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 product to enter drains, sewage systems, or other water courses.

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:

None.

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.

Recommended filter device for short term use:

Use a respirator with type P100 (USA) or P3 (EN 143) cartridges as a backup to engineering controls. Risk assessment should be performed to determine if air-purifying respirators are appropriate. Only use equipment tested and approved under appropriate government standards.

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.

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

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

Flammability (solid, gas)

No data available.
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 (H₂O): Insoluble
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
Reacts with strong oxidizing agents
Conditions to avoid
No data available
Incompatible materials:
Oxidizing agents
Hazardous decomposition products:
Zinc oxide
Titanium oxides

SECTION 11. TOXICOLOGICAL INFORMATION

Information on toxicological effects
Acute toxicity:
Harmful if inhaled.
LD/LC50 values that are relevant for classification:

No data
Skin irritation or corrosion:
May cause irritation
Eye irritation or corrosion:
May cause irritation
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:
No effects known.
Additional toxicological information:
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
Carcinogenic categories
OSHA-Ca (Occupational Safety & Health Administration)
Substance is not listed.

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:
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

UN-Number

DOT, ADN, IMDG, IATA

N/A

UN proper shipping name

DOT, ADN, IMDG, IATA

N/A

Transport hazard class(es)

DOT, ADR, ADN, IMDG, IATA

Class

N/A

Packing group

DOT, IMDG, IATA

N/A

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:

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

H332 Harmful if inhaled.

Precautionary statements

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P271

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P304+P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P312

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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)

12036-69-0 Zinc titanium 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.

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.

Research

- Rational design and preparation of nanoheterostructures based on zinc titanate for solar-driven photocatalytic conversion of CO₂ to valuable fuels. Jiaxue Lu, Deli Li, Yao Chai, Li Li, Jun Liang. *Applied Catalysis B: Environmental*, Volume 256, 5 November 2019, Article 117800.
- Cathodoluminescence study of defects in thermal treatment of zinc titanate thin films deposited by a cosputtering process. Chiang TY, Tsai CH, Huang MC, Wen HC, Chou WC. *Surface and Interface Analysis*. 2018 May;50(5):541-6.
- Characterization of ZnO–TiO₂ and zinc titanate nanoparticles synthesized by hydrothermal process. Arin J, Thongtem S, Phuruangrat A, Thongtem T. *Research on Chemical Intermediates*. 2017 May 1;43(5):3183-95.
- Germanium-substituted Zn₂TiO₄ solid solution photocatalyst for conversion of CO₂ into fuels. Chai Y, Li L, Lu J, Li D, Shen J, Zhang Y, Liang J, Wang X. *Journal of Catalysis*. 2019 Mar 1;371:144-52.
- Fabrication of ZnO-Zn₂TiO₄ nanocomposite from zinc hydroxide nitrate and its photocatalytic efficiency. Pinto RB, Peralta-Zamora P, Wypych F. *Journal of Photochemistry and Photobiology A: Chemistry*. 2018 Feb 15;353:46-52.
- Zn₂TiO₄: Eu³⁺ nanophosphor: self explosive route and its near UV excited photoluminescence properties for WLEDs. Girish KM, Naik R, Prashantha SC, Nagabhushana H, Nagaswarupa HP, Raju KA, Premkumar HB, Sharma SC, Nagabhushana BM. *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*. 2015 Mar 5;138:857-65.
- Effect of zinc titanate nanoparticles on rheological and filtration properties of water based drilling fluids. Shama Perween, Mukarram Beg, Ravi Shankar, Shivanjali Sharma, Amit Ranjan. *Journal of Petroleum Science and Engineering*, Volume 170, November 2018, Pages 844-857.
- Zinc titanate nanoarrays with superior optoelectrochemical properties for chemical sensing. Abdul Haroon Rashid SSA, Sabri YM, Kandjani AE, Harrison CJ, Canjeevaram Balasubramanyam RK, Della Gaspera

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- Facile synthesis of noble-metal free polygonal Zn₂TiO₄ nanostructures for highly efficient photocatalytic hydrogen evolution under solar light irradiation. Manchala S, Nagappagari LR, Venkatakrishnan SM, Shanker V. International Journal of Hydrogen Energy. 2018 Jul 19;43(29):13145-57.
- Ethanol sensing properties of Zn₂TiO₄ particles. Santhaveesuk T, Gardchareon A, Wongratanaphisan D, Choopun S. Ceramics International. 2015 Jul 1;41:S809-13.