

Cobalt Monoantimonide		Pricing >
Linear Formula	CoSb	
Pubchem CID	292777	
MDL Number	MFCD00673092	
EC No.	234-993-9	
IUPAC Name	stibanylidynecobalt	
Beilstein/Reaxys No.	N/A	
SMILES	[Co]#[Sb]	
Inchi Identifier	InChI=1S/Co.Sb	
Inchi Key	UFIKNOKSPUOCL-UHFFFAOYSA-N	
Signal Word	Danger	
Hazard Statements	H302 + H332-H311-H315-H319-H335-H411	
Hazard Codes	Xn,N	
Risk Codes	20/22-51/53	
Safety Statements	61	
RTECS Number	N/A	
Transport Information	UN 1549 6.1 / PGIII	
WGK Germany	3	

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SAFETY DATA SHEET

Date Accessed: 05/06/2024

Date Revised: 01/15/2022

SECTION 1. IDENTIFICATION

Product Identifiers: All applicable American Elements product codes for CAS #12052-42-5

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

SECTION 2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

2.2 GHS Label elements, including precautionary statements

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Synonyms : Cobalt antimonide

Formula : CoSb

Molecular weight : 180.69 g/mol

CAS-No. : 12052-42-5

EC-No. : 234-993-9

Index-No. : 051-003-00-9

Hazardous components

Component Classification Concentration

Cobalt monoantimonide

<= 100 %

SECTION 4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled

If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact

Wash off with soap and plenty of water. Take victim immediately to hospital. Consult a physician.

In case of eye contact

Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed

Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

SECTION 5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

Cobalt/cobalt oxides, Antimony oxide

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Wear respiratory protection. Avoid dust formation.

Avoid breathing Vapors, mist or gas. Ensure adequate ventilation.

Evacuate personnel to safe areas. Avoid breathing dust.

For personal protection see section 8.

6.2 Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust.

Sweep up and shovel. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid contact with skin and eyes. Avoid formation of dust and aerosols.

Provide appropriate exhaust ventilation at places where dust is formed.

For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Keep container tightly closed in a dry and well-ventilated place.

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Components with workplace control parameters

Component CAS-No. Value Control parameters

Basis

Cobalt

monoantimonide

12052-42-5 TWA 0.500000

mg/m³

USA. Occupational Exposure Limits

(OSHA) - Table Z-1 Limits for Air

Contaminants

TWA 0.500000

mg/m³

USA. ACGIH Threshold Limit Values

(TLV)

Remarks Upper Respiratory Tract irritation

Skin irritation

TWA 0.020000

mg/m³

USA. ACGIH Threshold Limit Values

(TLV)

Pulmonary function

Asthma

Myocardial effects

Substances for which there is a Biological Exposure

Index or Indices

(see BEI® section)

Confirmed animal carcinogen with unknown relevance

to humans
varies
TWA 0.500000
mg/m³
USA. NIOSH Recommended
Exposure Limits
8.2 Exposure controls
Appropriate engineering controls
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.
Personal protective equipment
Eye/face protection
Face shield and safety glasses Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).
Skin protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after
use in accordance with applicable laws and good laboratory practices. Wash and dry hands.
Body Protection
Complete suit protecting against chemicals, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N99 (US) or type P2 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the
sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and
approved under appropriate government standards such as NIOSH (US) or CEN (EU).
Control of environmental exposure
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

- 9.1 Information on basic physical and chemical properties
- a) Appearance Form: solid
 - b) Odor No data available

c) Odor Threshold No data available
d) pH No data available
e) Melting point/freezing point
Melting point/range: 1,202 °C (2,196 °F) - lit.
f) Initial boiling point and boiling range
No data available
g) Flash point No data available
h) Evaporation rate No data available
i) Flammability (solid, gas) No data available
j) Upper/lower flammability or explosive limits
No data available
k) Vapor pressure No data available
l) Vapor density No data available
m) Relative density No data available
n) Water solubility No data available
o) Partition coefficient: octanol/water
No data available
p) Auto-ignition temperature
No data available
q) Decomposition temperature
No data available
r) Viscosity No data available
s) Explosive properties No data available
t) Oxidizing properties No data available
9.2 Other safety information
No data available

SECTION 10. STABILITY AND REACTIVITY

10.1 Reactivity
No data available
10.2 Chemical stability
Stable under recommended storage conditions.
10.3 Possibility of hazardous reactions
No data available
10.4 Conditions to avoid
No data available
10.5 Incompatible materials
Strong acids
10.6 Hazardous decomposition products
Other decomposition products - No data available
In the event of fire: see section 5

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity

No data available

Inhalation: No data available

Dermal: No data available

No data available

Skin corrosion/irritation

No data available

Serious eye damage/eye irritation

No data available

Respiratory or skin sensitisation

No data available

Germ cell mutagenicity

No data available

Carcinogenicity

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Cobalt monoantimonide)

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Reproductive toxicity

No data available

No data available

Specific target organ toxicity - single exposure

Inhalation - May cause respiratory irritation.

Specific target organ toxicity - repeated exposure

No data available

Aspiration hazard

No data available

Additional Information

RTECS: Not available

dry throat, Cough, Lung irritation, Difficulty in breathing, Skin irritation, Eye irritation, May cause headache and

dizziness., Headache, May cause nausea, abdominal spasms and irritation of the mucous membranes.,

Fever, cramps,

Vomiting, Diarrhoea, Anorexia., metallic taste,

Salivation, Dizziness, moderate to severe pain, sleep disturbances

Stomach - Irregularities - Based on Human Evidence

Stomach - Irregularities - Based on Human Evidence

SECTION 12. ECOLOGICAL INFORMATION

12.1 Toxicity

No data available

12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

Toxic to aquatic life with long lasting effects.

An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

No data available

SECTION 13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste

disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a

chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging

Dispose of as unused product.

SECTION 14. TRANSPORT INFORMATION

DOT (US)

UN number: 1549 Class: 6.1 Packing group: III

Proper shipping name: Antimony compounds, inorganic, solid, n.o.s. (Cobalt monoantimonide)

Reportable Quantity (RQ):

Poison Inhalation Hazard: No

IMDG

UN number: 1549 Class: 6.1 Packing group: III EMS-No: F-A, S-A

Proper shipping name: ANTIMONY COMPOUND, INORGANIC, SOLID, N.O.S. (Cobalt monoantimonide)

Marine pollutant: yes

IATA

UN number: 1549 Class: 6.1 Packing group: III

Proper shipping name: Antimony compound, inorganic, solid, n.o.s. (Cobalt monoantimonide)

SECTION 15. REGULATORY INFORMATION

SARA 302 Components

No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components

The following components are subject to reporting levels established by SARA Title III, Section 313:

Cobalt monoantimonide

CAS-No.

12052-42-5

Revision Date

2007-07-01

SARA 311/312 Hazards

Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

No components are subject to the Massachusetts Right to Know Act.

Pennsylvania Right To Know Components

Cobalt monoantimonide

CAS-No.

12052-42-5

Revision Date

2007-07-01

New Jersey Right To Know Components

Cobalt monoantimonide

CAS-No.

12052-42-5

Revision Date

2007-07-01

California Prop. 65 Components

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

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

Research

- Effect of heating cycle on cobalt-antimonide-based thin films for high-temperature thermoelectric energy conversion applications. Aziz Ahmed, Seungwoo Han. *Journal of Alloys and Compounds*, Volume 790, 25 June 2019, Pages 577-586.
- Influence of deposition temperature on the microstructure and thermoelectric properties of antimonide cobalt thin films prepared by ion beam sputtering deposition. Zhuang-hao Zheng, Ping Fan, Guang-xing Liang, Dong-ping Zhang. *Journal of Alloys and Compounds*, Volume 619, 15 January 2015, Pages 676-680.
- Synthesis of CoSb thermoelectric material by microwave induced plasma heating. Threrujirapapong T, Khailaew P, Deesupap Y, Plirdpring T, Suriwong T. *Materials Today: Proceedings*. 2018 Jan 1;5(3):9579-83.
- Template-based fabrication and electrochemical performance of CoSb nanowire arrays. You-wen Yang, Yan-biao Chen, Fei Liu, Xiang-ying Chen, Yu-cheng Wu. *Electrochimica Acta*, Volume 56, Issue 18, 15 July 2011, Pages 6420-6425.
- Preparation and electrochemical performance of CoSb alloy anode material for Li-ion batteries. Mengwei Wang, Hailei Zhao, Jianchao He, Ronglin Wang, Ning Chen. *Journal of Alloys and Compounds*, Volume 484, Issues 1–2, 18 September 2009, Pages 864-869.
- Thermodynamic and kinetic analysis for carbothermal reduction process of CoSb alloy powders used as anode for lithium ion batteries. Jianying Yang, Mengwei Wang, Yuntong Zhu, Hailei Zhao, Jingbo Chen. *Journal of Alloys and Compounds*, Volume 509, Issue 28, 14 July 2011, Pages 7657-7661.
- Electrochemical performance of template-synthesized CoSb nanowires array as an anode material for lithium ion batteries. You-wen Yang, Fei Liu, Tian-ying Li, Yan-biao Chen, Ming-guang Kong. *Scripta Materialia*, Volume 66, Issue 7, April 2012, Pages 495-498.
- Self-assembly of CoSb-nanocrystal/graphene hybrid nanostructure with improved Li-storage properties via a facile in situ solvothermal route. Yunxiao Zheng, Jian Xie, Shuangyu Liu, Wentao Song, Xinbing Zhao. *Journal of Power Sources*, Volume 202, 15 March 2012, Pages 276-283.
- Structure and transport behavior of In-filled cobalt rhodium antimonide skutterudites. James Eilertsen, Romain Berthelot, Arthur W. Sleight, M. A. Subramanian. *Journal of Solid State Chemistry*, Volume 190, June 2012, Pages 238-245.
- Thermoelectric properties of cobalt–antimonide thin films prepared by radio frequency co-sputtering. Aziz Ahmed, Seungwoo Han. *Thin Solid Films*, Volume 587, 31 July 2015, Pages 150-155.