



Cobalt(III) Oxide	Pricing >
Cobalt(III) Oxide Nanoparticles / Nanopowder	Pricing >

Linear Formula	Co ₂ O ₃
Pubchem CID	4110762
MDL Number	MFCD00036266
EC No.	215-156-7
IUPAC Name	oxo(oxocobaltiooxy) cobalt
Beilstein/Reaxys No.	N/A
SMILES	[Cd]=O
Inchl Identifier	InChI=1S/2Co.3O
Inchl Key	UPWOEMHINGJHOB-UHFFFAOYSA-N

Signal Word	Warning
Hazard Statements	H302-H317-H351
Hazard Codes	Xn
Precautionary Statements	P280
Flash Point	Not applicable
Risk Codes	22-40-43
Safety Statements	36/37
RTECS Number	GG2900000
Transport Information	NONH
WGK Germany	3
GHS Pictograms	<p>GHS07 Exclamation Point</p>  <p>GHS08 Health Hazard</p> 

SAFETY DATA SHEET

Date Accessed: 04/20/2024

Date Revised: 01/15/2022

SECTION 1. IDENTIFICATION

Product Identifiers: All applicable American Elements product codes for CAS #1308-04-9

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

Emergency Overview
OSHA Hazards
Carcinogen, Harmful by ingestion., Skin sensitiser
GHS Classification
Acute toxicity, Oral(Category 4)
Skin sensitization(Category 1)
Carcinogenicity(Category 2)
GHS Label elements, including precautionary statements
Pictogram



Signal word
Warning
Hazard statement(s)
H302
Harmful if swallowed.
H317
May cause an allergic skin reaction.
H351
Suspected of causing cancer.
Precautionary statement(s)

P280

Wear protective gloves.

HMIS

Classification

Health hazard: 2

Chronic Health Hazard:*

Flammability: 0

Physical hazards: 0

NFPA Rating

Health hazard: 2

Fire: 0

Reactivity Hazard: 0

Potential Health Effects

Inhalation

May be harmful if inhaled. May cause respiratory tract irritation.

Skin

May be harmful if absorbed through skin. May cause skin irritation.

Eyes

May cause eye irritation.

Ingestion

Toxic if swallowed.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Formula: Co_2O_3

Molecular Weight: 165.86 g/mol

CAS-No.

1308-04-9

EC-No.

215-156-7

SECTION 4. 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. Consult a physician.

In case of eye contact

Flush eyes with water as a precaution.

If swallowed

Never give anything by mouth to an unconscious

person. Rinse mouth with water. Consult a physician.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Special protective equipment for firefighters

Wear self contained breathing apparatus for fire fighting if necessary.

Hazardous combustion products

Hazardous decomposition products formed under fire conditions.-Cobalt/cobalt oxides

Hazardous decomposition products formed under fire conditions.-Cobalt/cobalt oxides

Further information

The product itself does not burn.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas.

Ensure adequate ventilation. Evacuate personnel to safe areas. Avoid breathing dust.

Environmental precautions

Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

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.

SECTION 7. HANDLING AND STORAGE

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.

Conditions for safe storage

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

Keep in a dry place.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Personal protective equipment

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N100 (US) or type P3 (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).

Hand 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.

Eye 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 and 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.

Hygiene measures

Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form

powder

Colour

black

Safety data

pH

no data available

Melting point/freezing point

no data available

Boiling point

no data available

Flash point

not applicable

Ignition temperature
no data available
Autoignition temperature
no data available
Lower explosion limit
no data available
Upper explosion limit
no data available
Vapor pressure
no data available
Density
5.700 g/cm³ at 20 °C (68 °F)
5.700 g/cm³ at 20 °C (68 °F)
Water solubility
no data available
Partition coefficient: n-octanol/water
no data available
Relative Vapor density
no data available
Odor
odourless
Odor Threshold
no data available
Evaporation rate
no data available

SECTION 10. STABILITY AND REACTIVITY

Chemical stability
Stable under recommended storage conditions.
Possibility of hazardous reactions
no data available
Conditions to avoid
no data available
Materials to avoid
Strong oxidizing agents
Hazardous decomposition products
Hazardous decomposition products formed under fire conditions.-Cobalt/cobalt oxides
Hazardous decomposition products formed under fire conditions.-Cobalt/cobalt oxides
Other decomposition products-no data available

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity
Oral LD50
Inhalation LC50
no data available
Dermal LD50

no data available

Other information on acute toxicity

LD50 Subcutaneous-mouse-2,064 mg/kg

LD50 Subcutaneous-mouse-2,064 mg/kg

Skin corrosion/irritation

no data available

Serious eye damage/eye irritation

no data available

Respiratory or skin sensitization

May cause allergic skin reaction.

Germ cell mutagenicity

no data available

Carcinogenicity

This product is or contains a component that has been reported to be possibly carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.

Limited evidence of carcinogenicity in animal studies

IARC:

2B-Group 2B: Possibly carcinogenic to humans(Dicobalt trioxide)

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

Teratogenicity

no data available

Specific target organ toxicity -single exposure(Globally Harmonized System)

no data available

Specific target organ toxicity -repeated exposure(Globally Harmonized System)

no data available

Aspiration hazard

no data available

Potential health effects

Inhalation

May be harmful if inhaled. May cause respiratory tract irritation.

Ingestion

Toxic if swallowed.

Skin

May be harmful if absorbed through skin. May cause skin irritation.

Eyes

May cause eye irritation.

Synergistic effects

no data available

Additional Information

RTECS: GG2900000

SECTION 12. ECOLOGICAL INFORMATION

Toxicity
no data available
Persistence and degradability
no data available
Bioaccumulative potential
no data available
Mobility in soil
no data available
PBT and vPvB assessment
no data available
Other adverse effects
no data available

SECTION 13. DISPOSAL CONSIDERATIONS

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)
Not dangerous goods
IMDG
Not dangerous goods
IATA
Not dangerous goods

SECTION 15. REGULATORY INFORMATION

OSHA Hazards
Carcinogen, Harmful by ingestion., Skin sensitiser
SARA 302 Components
SARA 302: 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:
Dicobalt trioxide
CAS-No.
1308-04-9
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
Dicobalt trioxide
CAS-No.
1308-04-9
New Jersey Right To Know Components
Dicobalt trioxide
CAS-No.
1308-04-9
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 conditions of sale. COPYRIGHT 1997-2022 AMERICAN ELEMENTS. LICENSED GRANTED TO MAKE UNLIMITED PAPER COPIES FOR INTERNAL USE ONLY.

Research

- A cobalt oxide nanocubes interleaved reduced graphene oxide nanocomposite modified glassy carbon electrode for amperometric detection of serotonin. Muhammad Mehmood Shahid, Perumal Rameshkumar, Arshid Numan, Syed Shahabuddin, Wee Siong Chiu.

Materials Science and Engineering: C, Volume 100, July 2019, Pages 388-395.

- A combined self-assembly and calcination method for preparation of nanoparticles-assembled cobalt oxide nanosheets using graphene oxide as template and their application for non-enzymatic glucose biosensing. Haiyan Zhang, Sen Liu. *Journal of Colloid and Interface Science*, Volume 485, 1 January 2017, Pages 159-166.
- A direct route to activated two-dimensional cobalt oxide nanosheets for electrochemical energy storage, catalytic and environmental applications. J. M. Munuera, J. I. Paredes, S. Villar-Rodil, S. García-Dalí, J. M. D. Tascón. *Journal of Colloid and Interface Science*, Volume 539, 15 March 2019, Pages 263-276.
- A facile low-temperature synthesis of highly distributed and size-tunable cobalt oxide nanoparticles anchored on activated carbon for supercapacitors. Fengyu Zhou, Qinglei Liu, Jiajun Gu, Wang Zhang, Di Zhang. *Journal of Power Sources*, Volume 273, 1 January 2015, Pages 945-953.
- A novel asymmetric supercapacitor with an activated carbon cathode and a reduced graphene oxide–cobalt oxide nanocomposite anode. Li-Jing Xie, Jun-Feng Wu, Cheng-Meng Chen, Chang-Ming Zhang, Guo-Hua Sun. *Journal of Power Sources*, Volume 242, 15 November 2013, Pages 148-156.
- A novel foam combustion approach for the synthesis of nanocrystalline cobalt oxide powder. Bahaa M. Abu-Zied. *Ceramics International*, Volume 45, Issue 4, March 2019, Pages 4540-4548.
- A novel solution combustion synthesis of cobalt oxide nanoparticles as negative-electrode materials for lithium ion batteries. Wei Wen, Jin-Ming Wu, Jiang-Ping Tu. *Journal of Alloys and Compounds*, Volume 513, 5 February 2012, Pages 592-596.
- A simple wet-chemical synthesis, reaction mechanism, and charge storage application of cobalt oxide electrodes of different morphologies. P. S. Gaikar, S. T. Navale, V. V. Jadhav, P. V. Shinde, Rajaram S. Mane. *Electrochimica Acta*, Volume 253, 1 November 2017, Pages 151-162.
- Adsorption of microbial esterases on *Bacillus subtilis*-templated cobalt oxide nanoparticles. Eunjin Jang, Bum Han Ryu, Hyun-Woo Shim, Hansol Ju, T. Doohun Kim. *International Journal of Biological Macromolecules*, Volume 65, April 2014, Pages 188-192.
- Adsorption-semiconductor hydrogen sensors based on nanosized tin dioxide with cobalt oxide additives. Ludmila P. Oleksenko, Nelly P. Maksymovych, Andrii I. Buvailo, Igor P. Matushko, Norman Dollahon. *Sensors and Actuators B: Chemical*, Volume 174, November 2012, Pages 39-44.